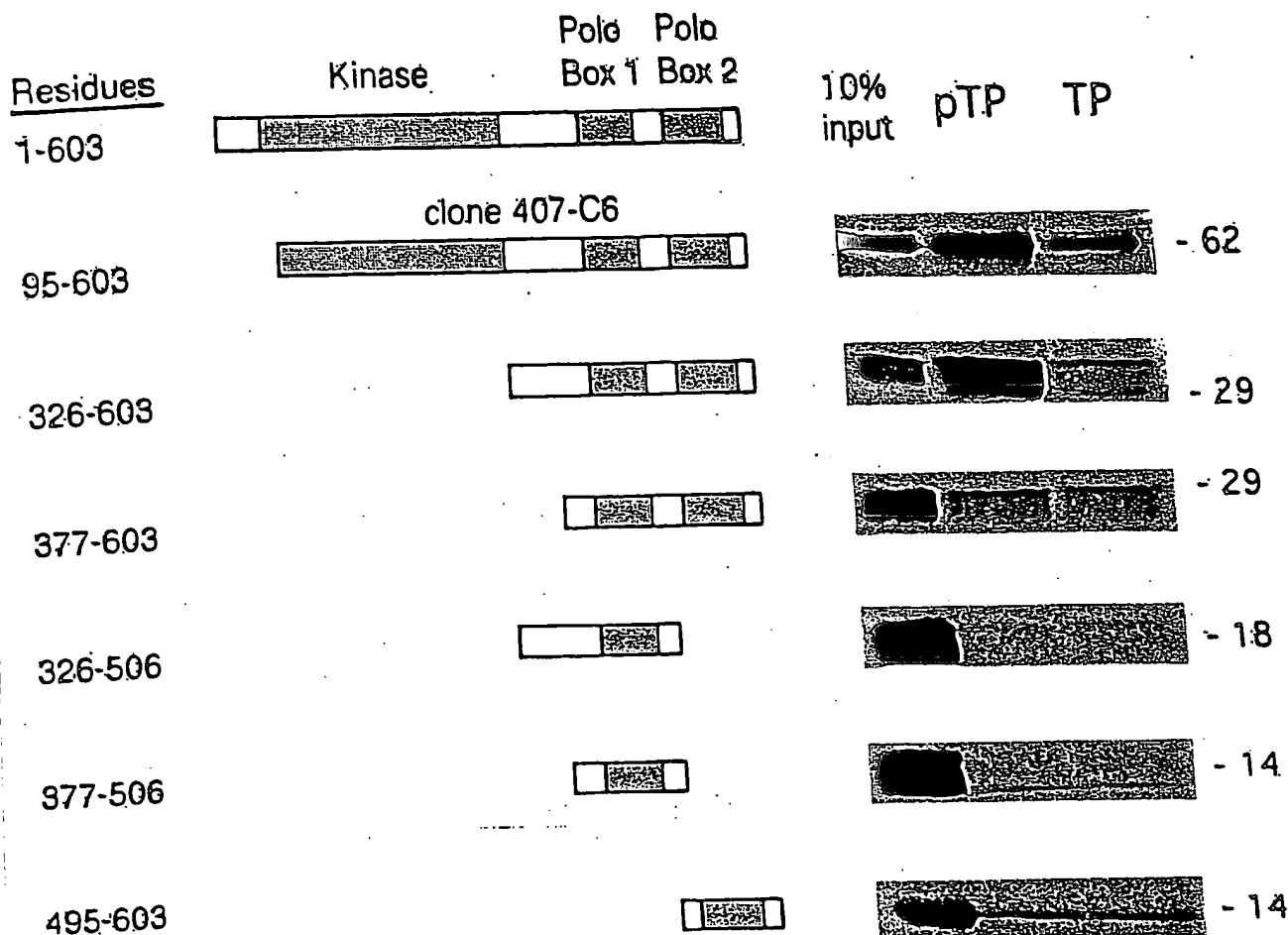


21



b

hPb1  
Pb1  
Pob

330 340 350 360 370 380 390

SIAPSSLDPSNRIKELIVL-----KGLNPLPER--PREKEPVVRETGEVVDCHLSDMI--HSVNAS  
SIAPSTIDOSIARKEITAJN-----KGDSPLVEKOVAPAKEEMGOPEFTEPADCYLSEMI--TCINAV  
GSNDTIEISMHRRKEEMEMNGIRPDDTILESTIFLKANLHDAITASAQVCRHS--DYRSDIESLY--ETNLING

400 410 420 430 440 450 460

ERGLVROEFAEIPACIPIVSWWWDYSSDCKYKGYGDFICDINSVGALSNDSRRLLYNDGDSLOYPERDGTIESLT  
ERALIROEFAEDVPAISIPVSWWWDYSSDCKYKGYGDFICDINSVGALSNDSRRLLYNDGDSLOYPERDGTIESLT  
LOGNLGDENTDPAIAGLPIVSWWWDYSSDCKYKGYGDFICDINSVGALSNDSRRLLYNDGDSLOYPERDGTIESLT

470 480 490 500 510 520 530

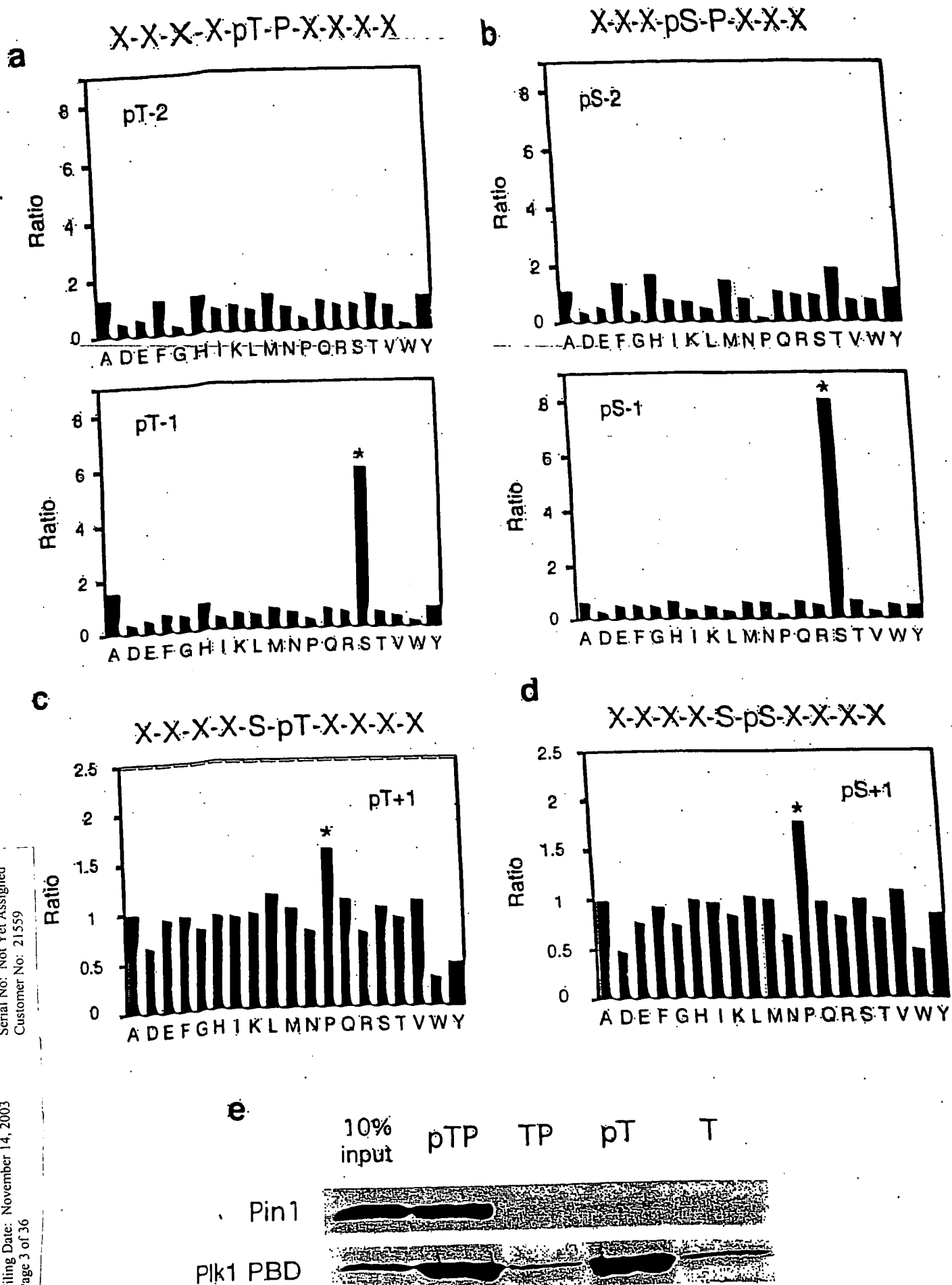
VSSHPNSIMKPIIIPKVRNYSSEHRLKATGHNITPREGDELARIPYIRIIPKVRNYSSEHRLKATGHNITPREGDELARIPYIRI  
VREYPTITIKKIMKESYKRNYSSEHRLKATGHNITPREGDELARIPYIRIIPKVRNYSSEHRLKATGHNITPREGDELARIPYIRI  
TTDYCKSDDKIMKESYKRNYSSEHRLKATGHNITPREGDELARIPYIRIIPKVRNYSSEHRLKATGHNITPREGDELARIPYIRI

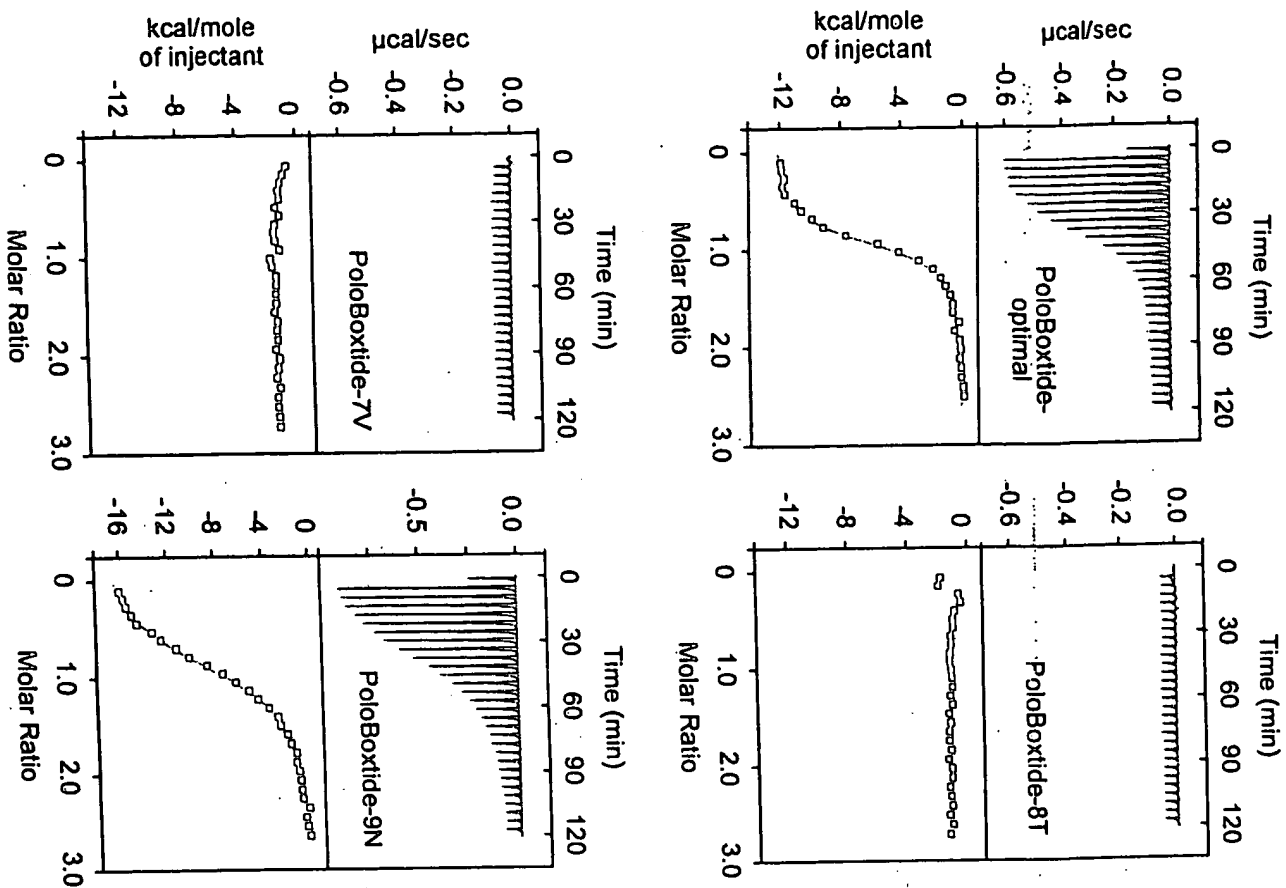
540 550 560 570 580 590 600

TAKIMKESYKRNYSSEHRLKATGHNITPREGDELARIPYIRIIPKVRNYSSEHRLKATGHNITPREGDELARIPYIRI  
TAKIMKESYKRNYSSEHRLKATGHNITPREGDELARIPYIRIIPKVRNYSSEHRLKATGHNITPREGDELARIPYIRI  
TAKIMKESYKRNYSSEHRLKATGHNITPREGDELARIPYIRIIPKVRNYSSEHRLKATGHNITPREGDELARIPYIRI

hPb1  
Pb1  
Pob

Figure 3

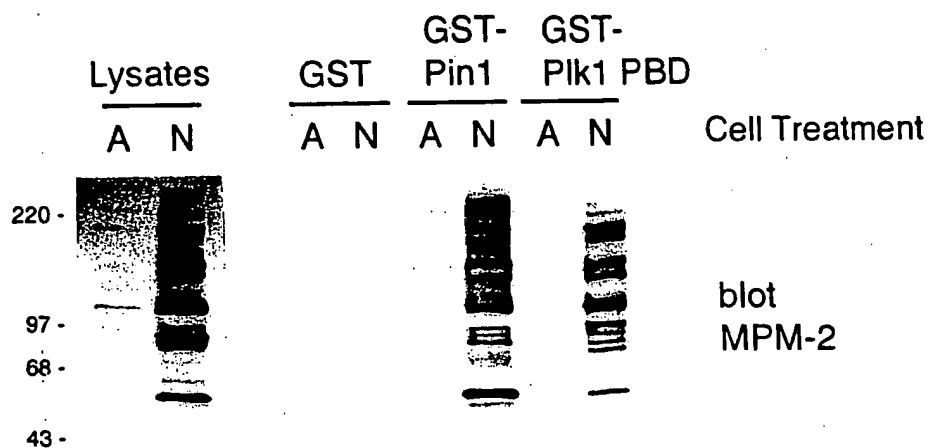
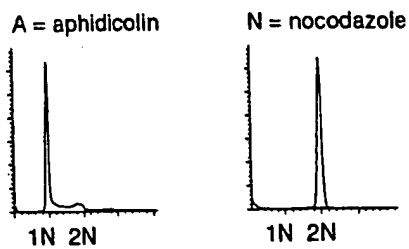




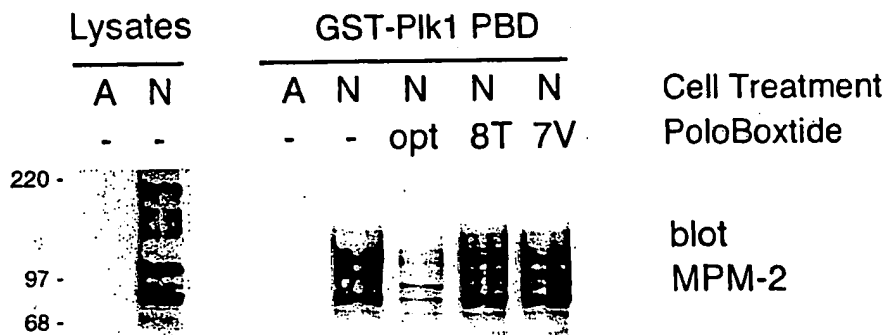
Peptide binding affinities for the Plk1 Polo Box Domain		
Peptide name	Peptide sequence	K <sub>d</sub>
PoloBoxide-optimal	MAGPMQ-S-pT-P-LNGAKK	280 ± 27 nM
Effect of pT		
PoloBoxide-8T	MAGPMQ-S-T-P-LNGAKK	N.D.B.
PoloBoxide-8pS	MAGPMQ-S-pS-P-LNGAYKK	2.1µM
PoloBoxide-8pY	MAGPMQ-S-pY-P-LNGAYKK	N.D.B.
Effect of serine at pT-1 position		
PoloBoxide-7V	MAGPMQ-V-pT-P-LNGAKK	N.D.B.
PoloBoxide-7A	MAGPMQ-A-pT-P-LNGAYKK	N.D.B.
PoloBoxide-7G	MAGPMQ-G-pT-P-LNGAYKK	N.D.B.
PoloBoxide-7C	MAGPMQ-C-pT-P-LNGAYKK	N.D.B.
PoloBoxide-7T	MAGPMQ-T-pT-P-LNGAYKK	N.D.B.
Effect of proline at pT+1 position		
PoloBoxide-9N	MAGPMQ-S-pT-N-LNGAKK	1.5µM

Figure 4

**a**



**b**



**Figure 5**

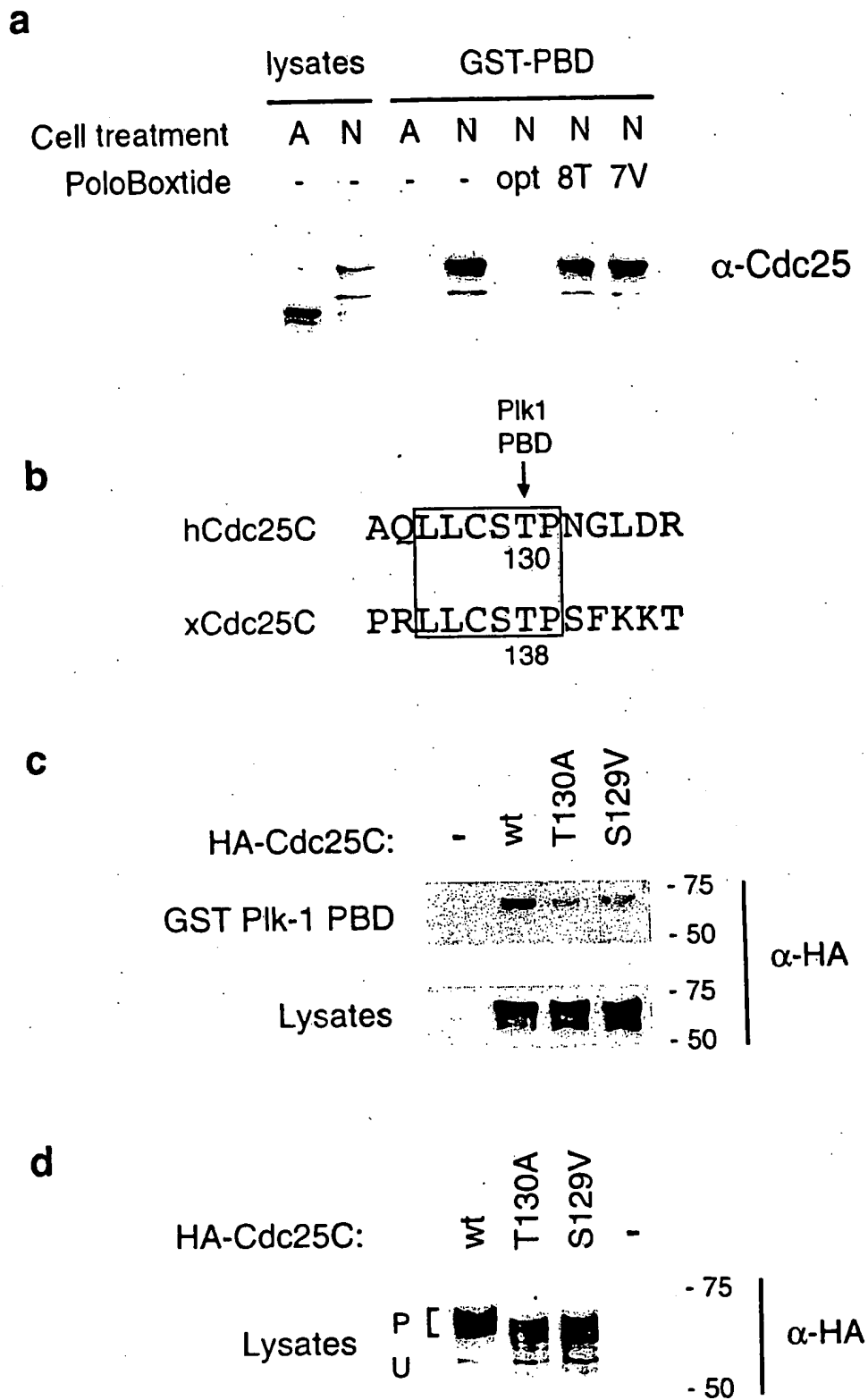


Figure 6

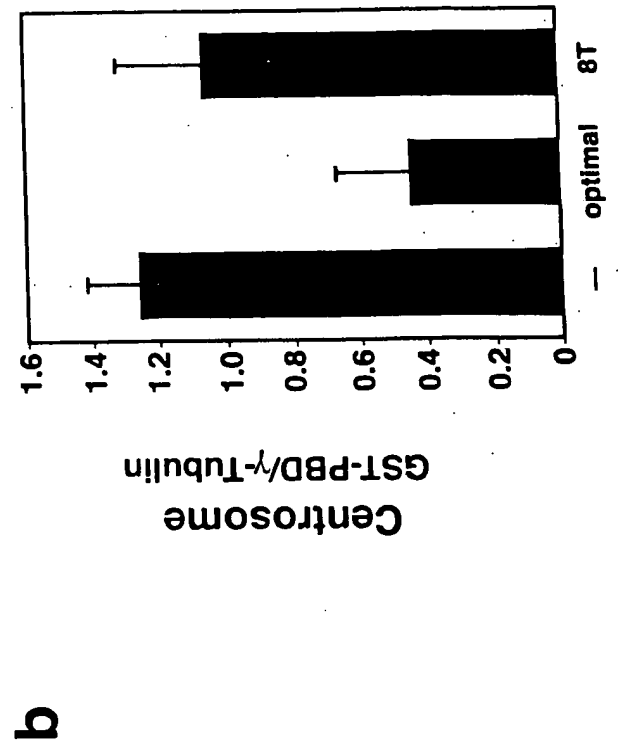
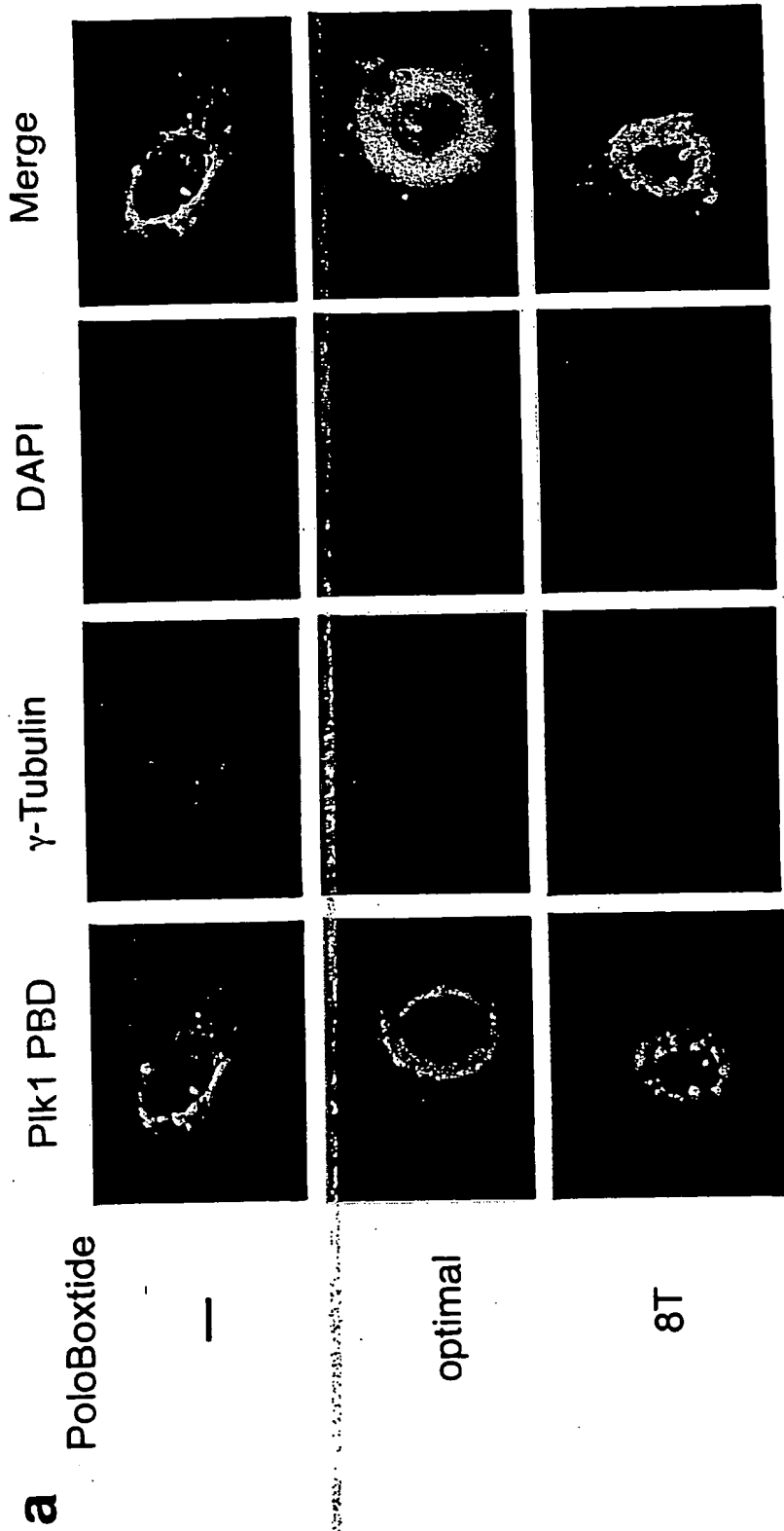


Figure 7

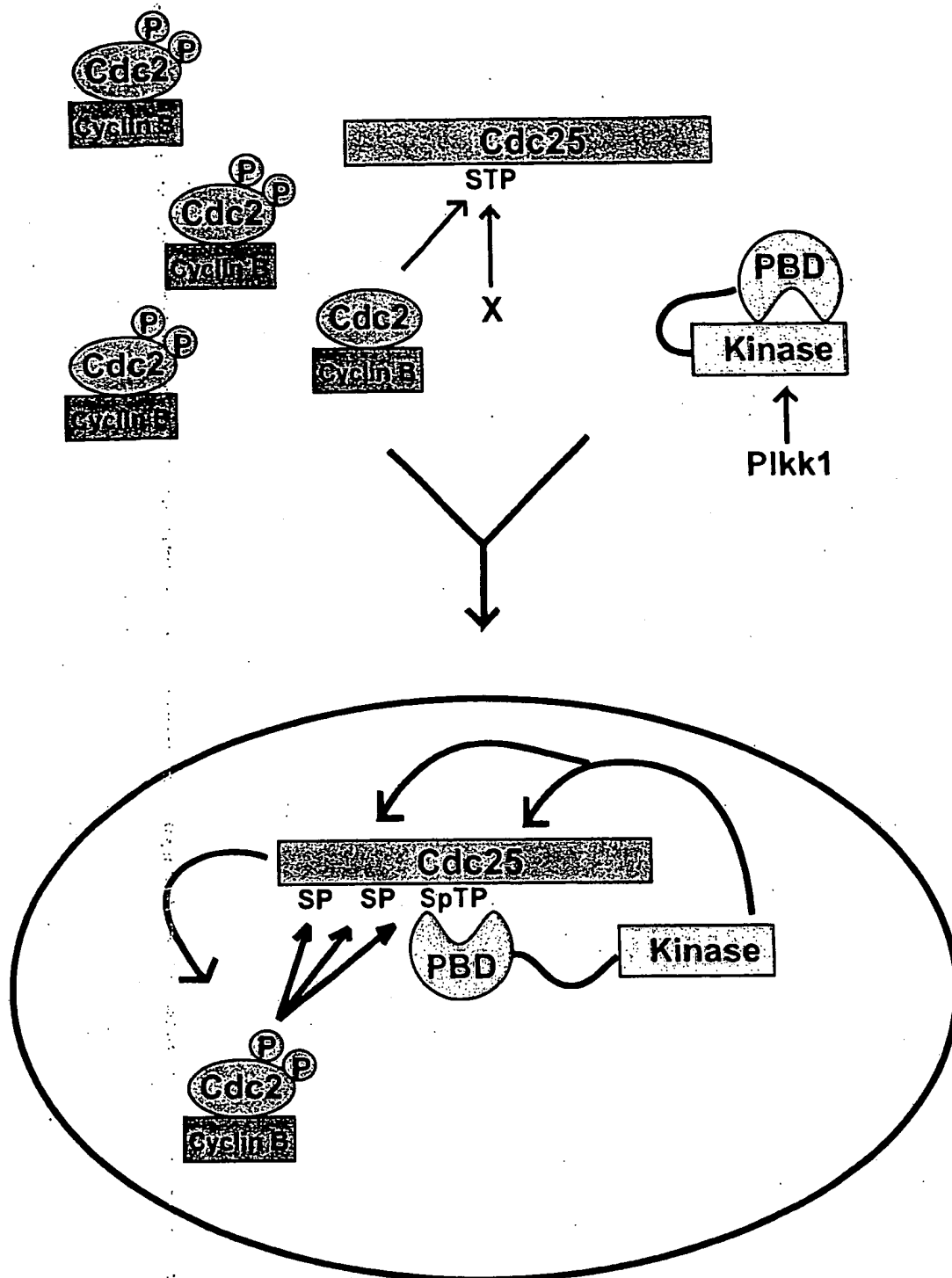


Figure 8

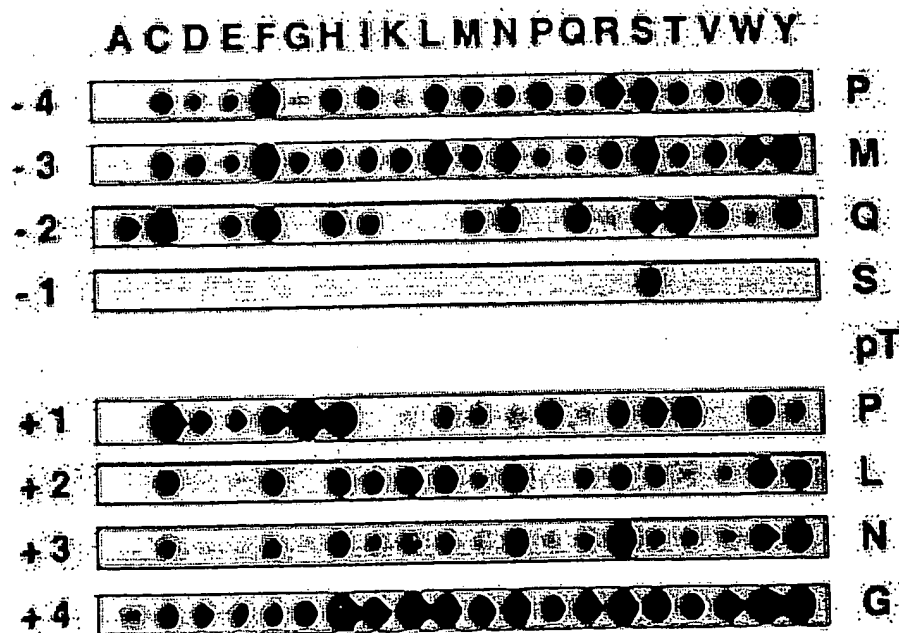


**A**

**pT-1 serine analogues abolish PIK1 PBD : peptide binding in solution**

Peptide name	Peptide sequence	$K_d$
PoloBoxide-optimal	MAGPMQ-S-pT-P-LNGAKK	$280 \pm 27$ nM
PoloBoxide-7A	MAGPMQ-A-pT-P-LNGAYKK	N.D.B.
PoloBoxide-7G	MAGPMQ-G-pT-P-LNGAYKK	N.D.B.
PoloBoxide-7C	MAGPMQ-C-pT-P-LNGAYKK	N.D.B.
PoloBoxide-7T	MAGPMQ-T-pT-P-LNGAYKK	N.D.B.

**B**



**Figure 9**

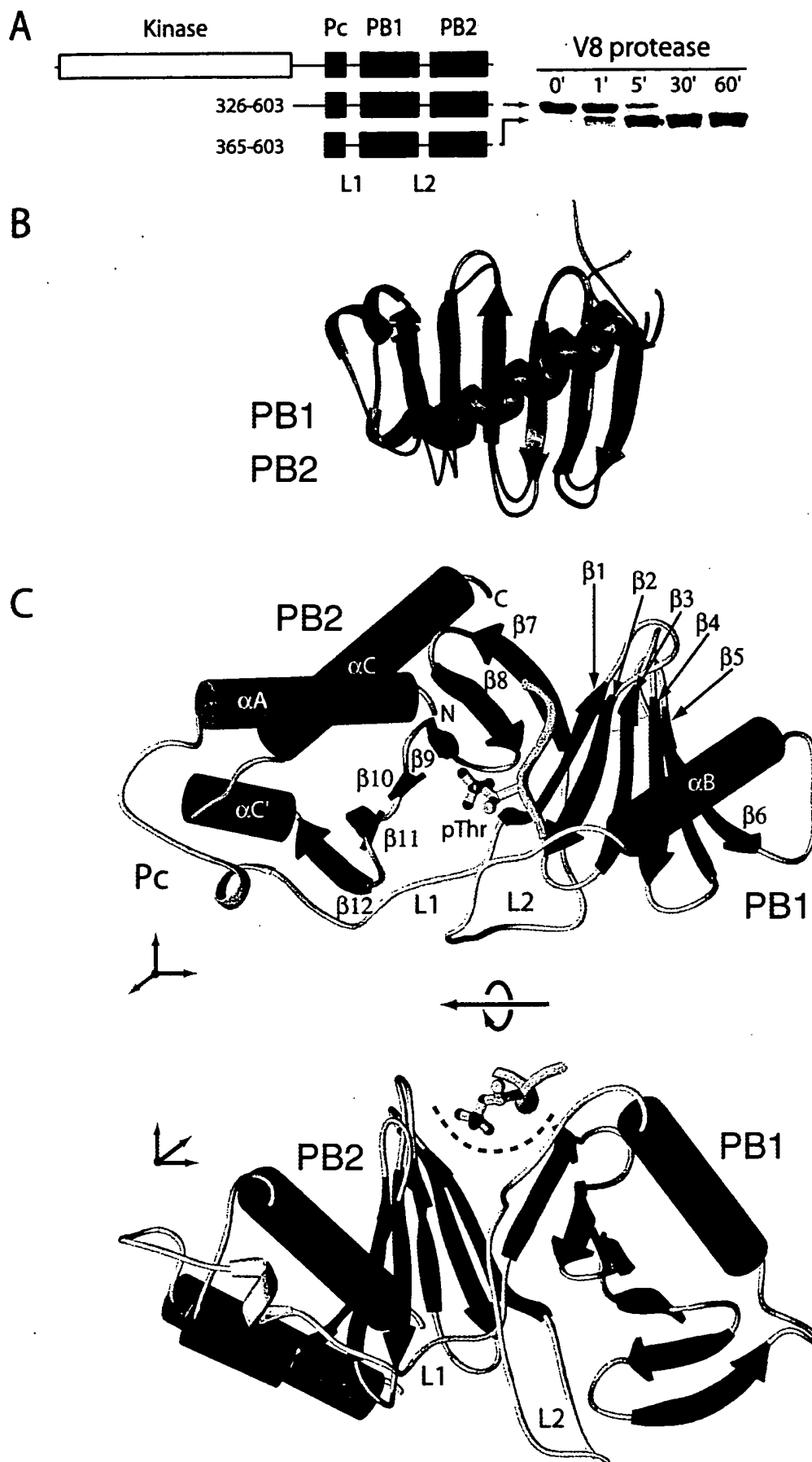


Figure 10

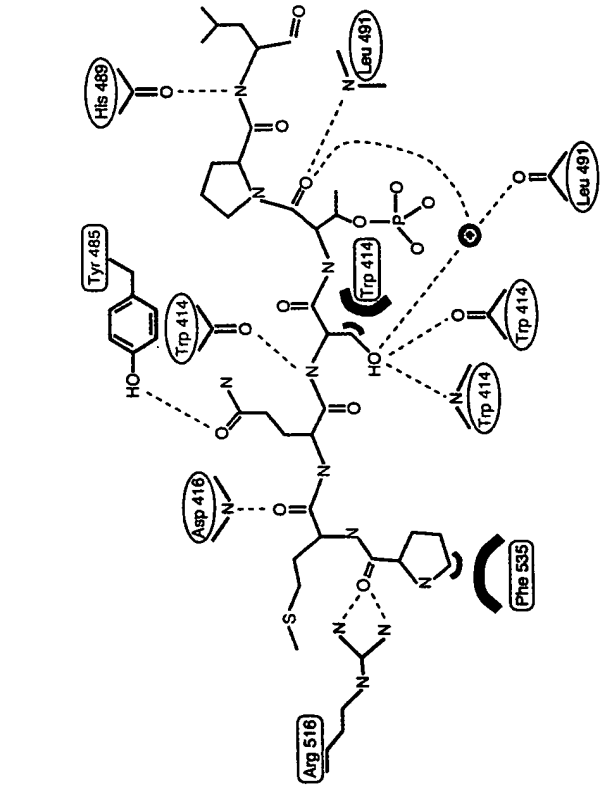
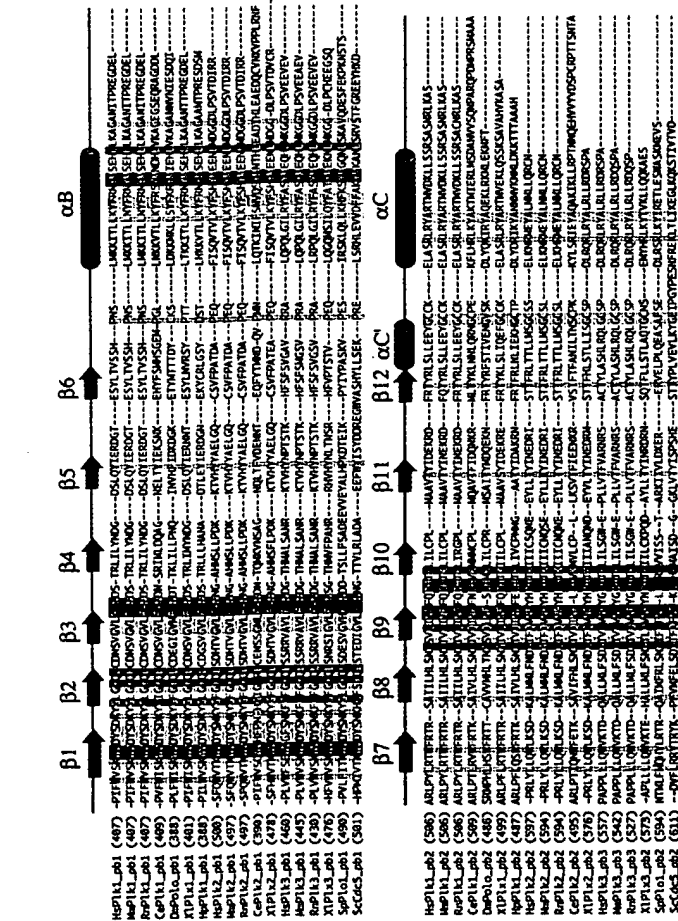
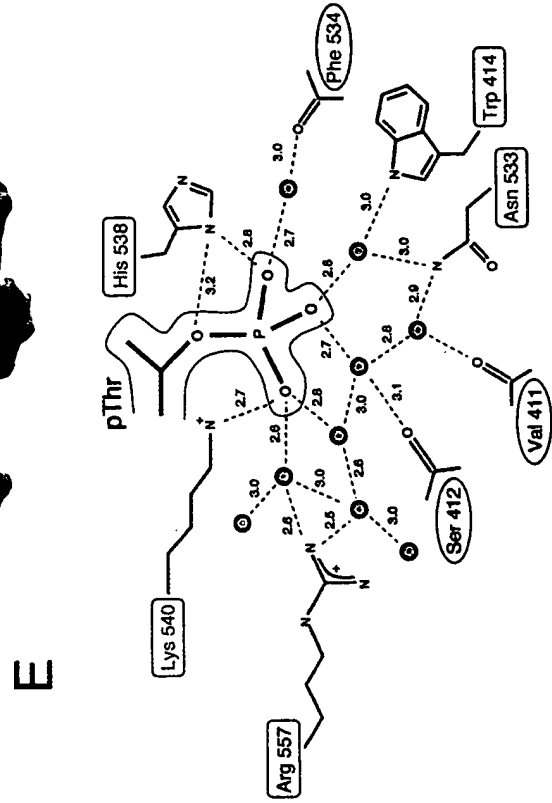
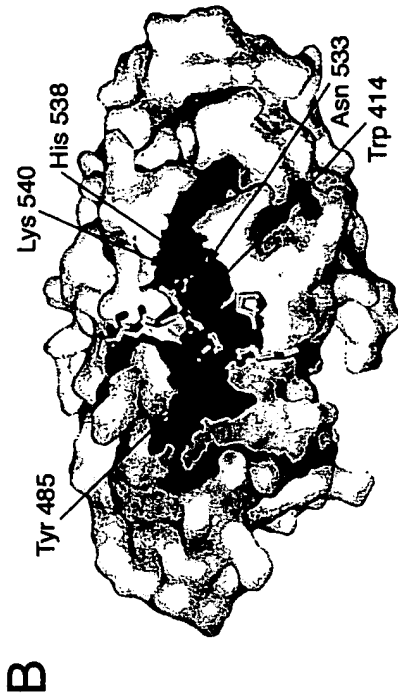
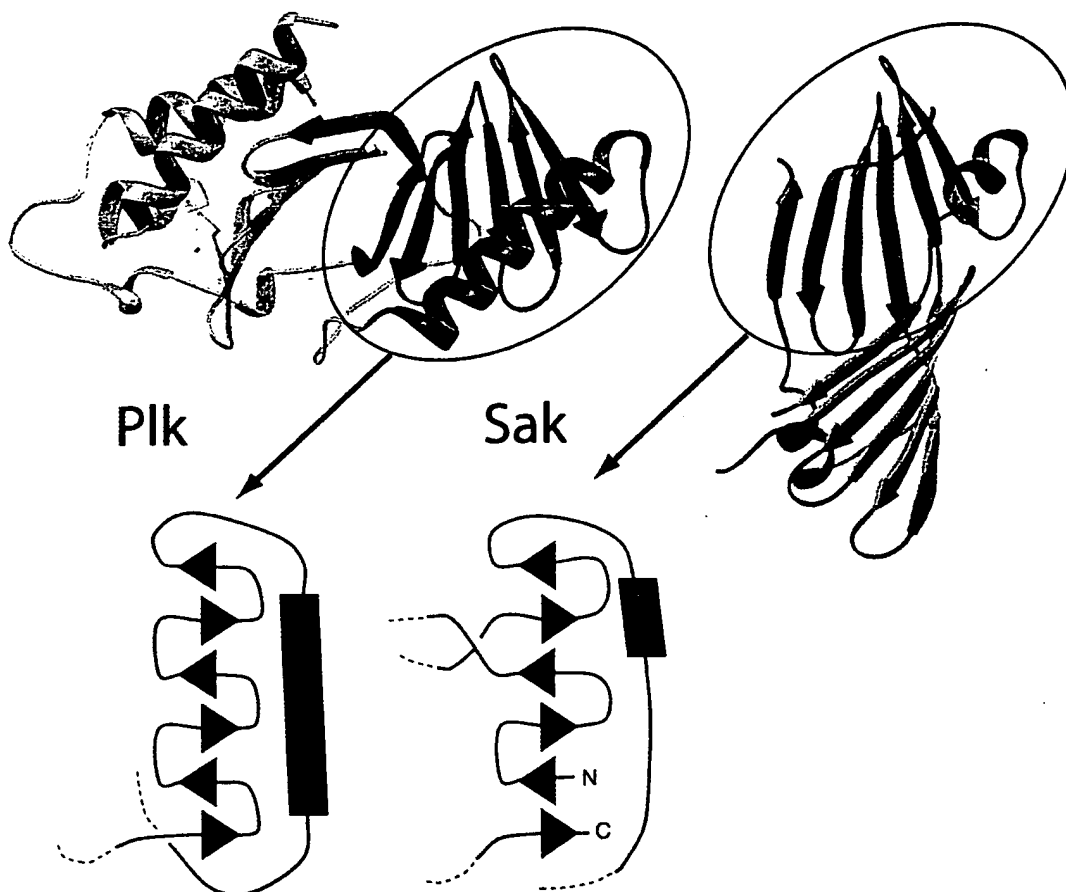


Figure 11

A



B

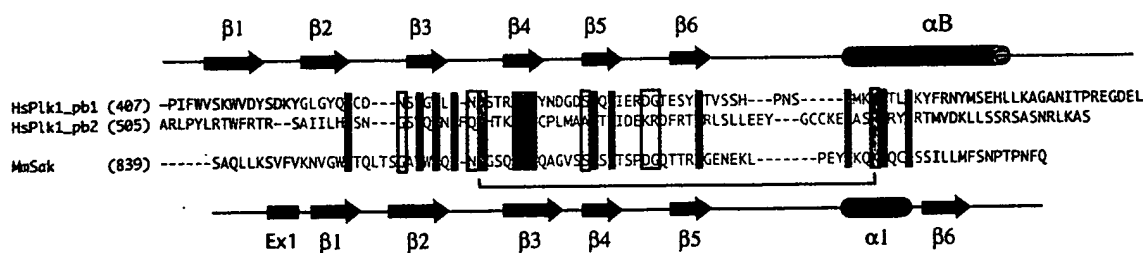
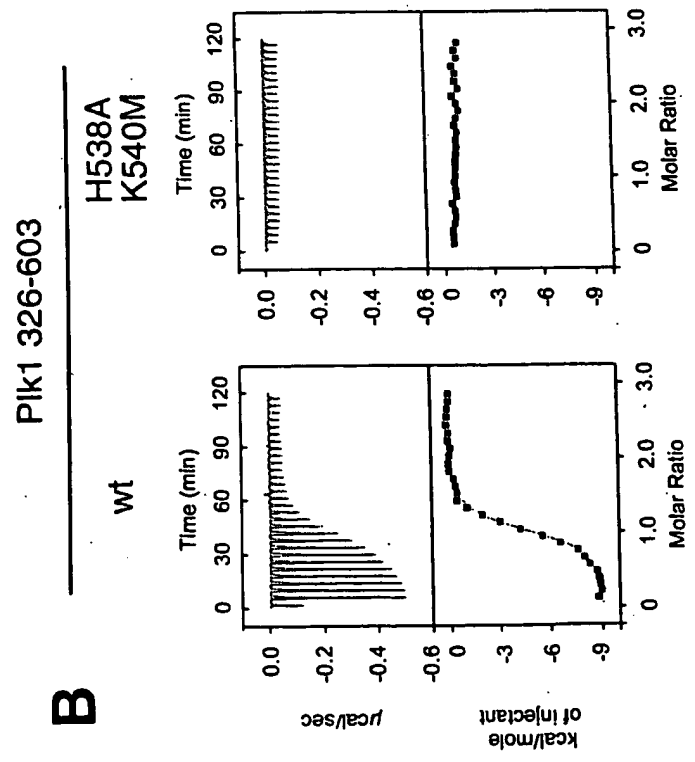


Figure 12

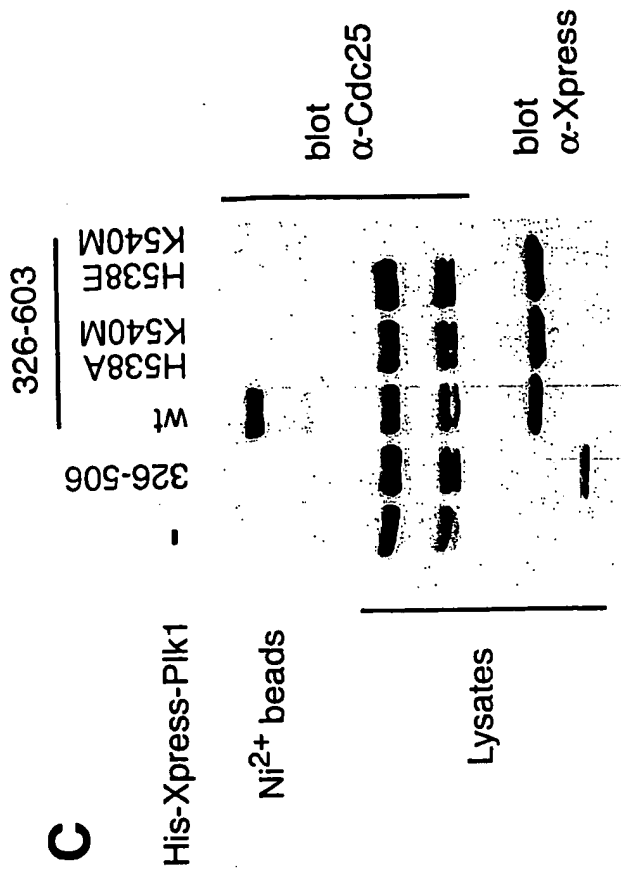
**A**



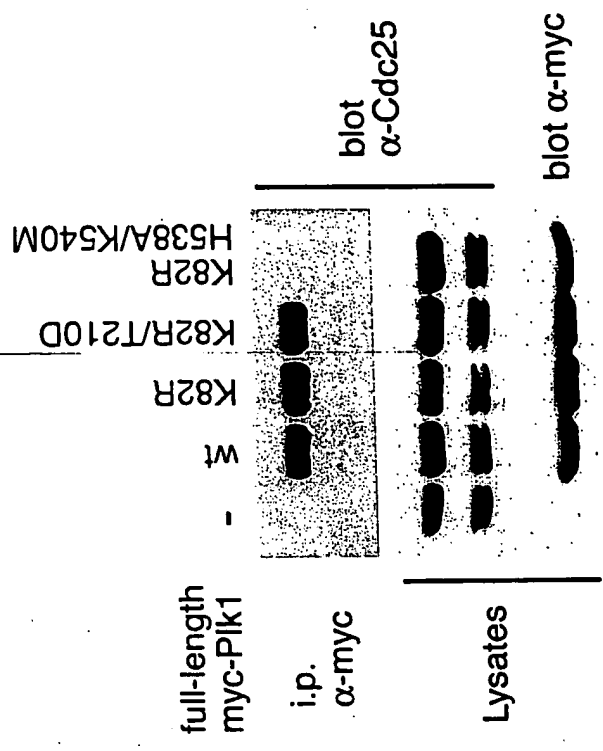
**B**



**C**



**D**



**Figure 13**

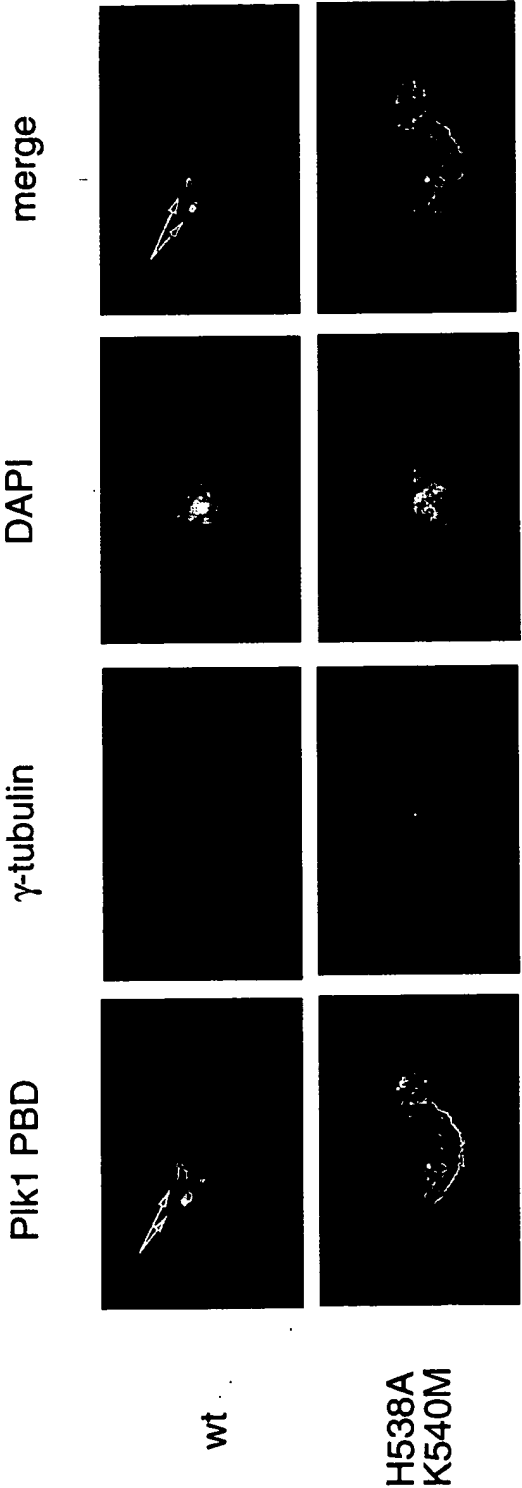


Figure 14

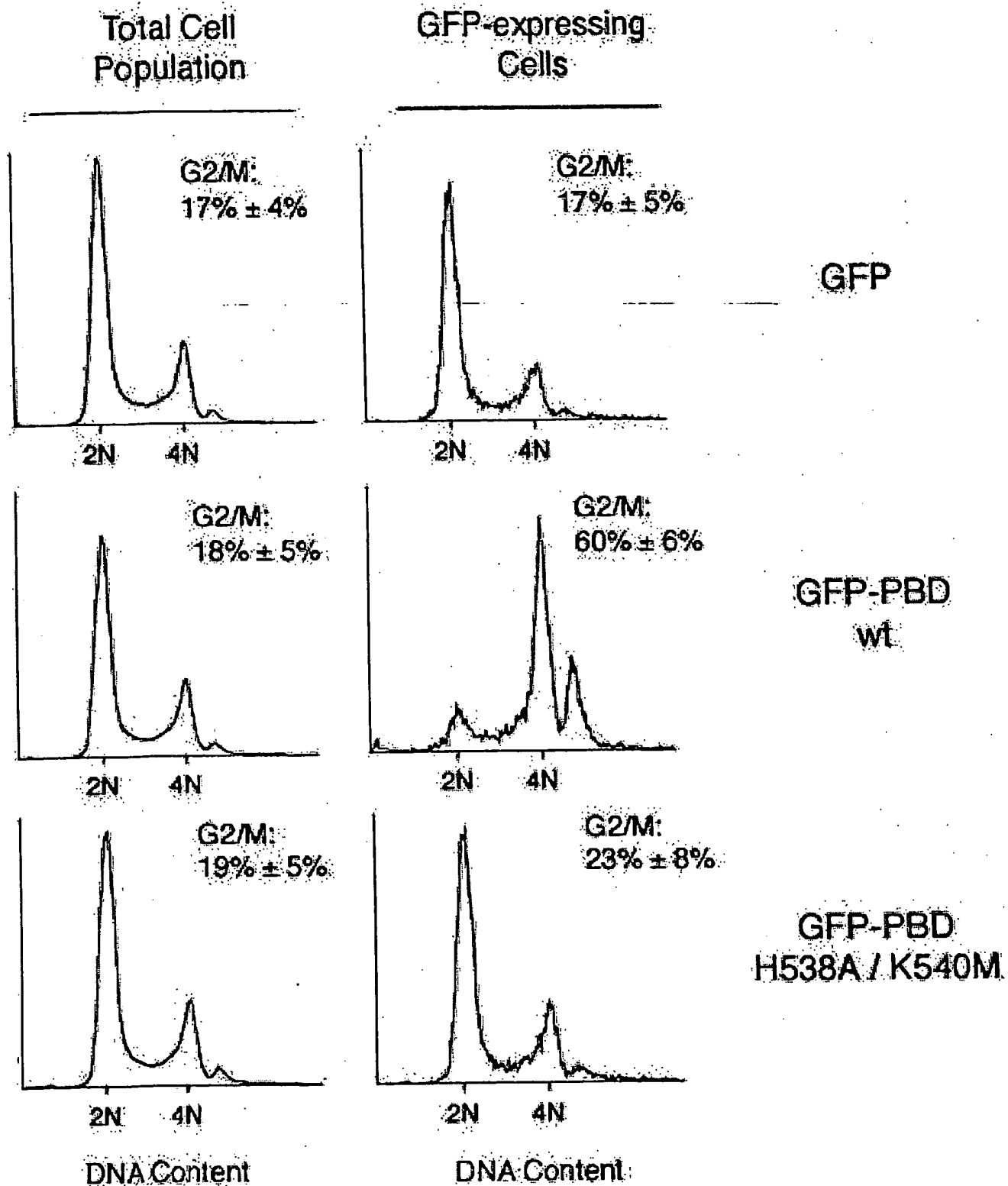
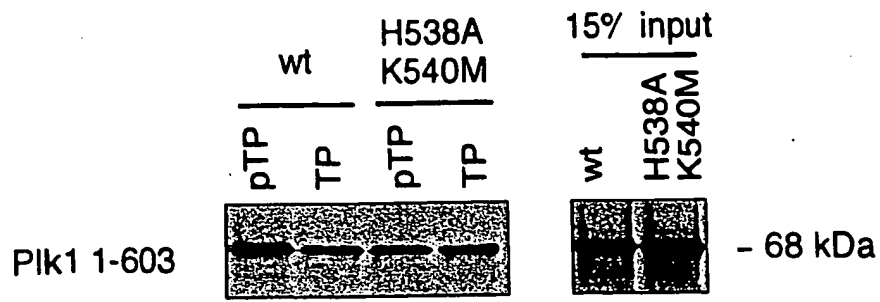
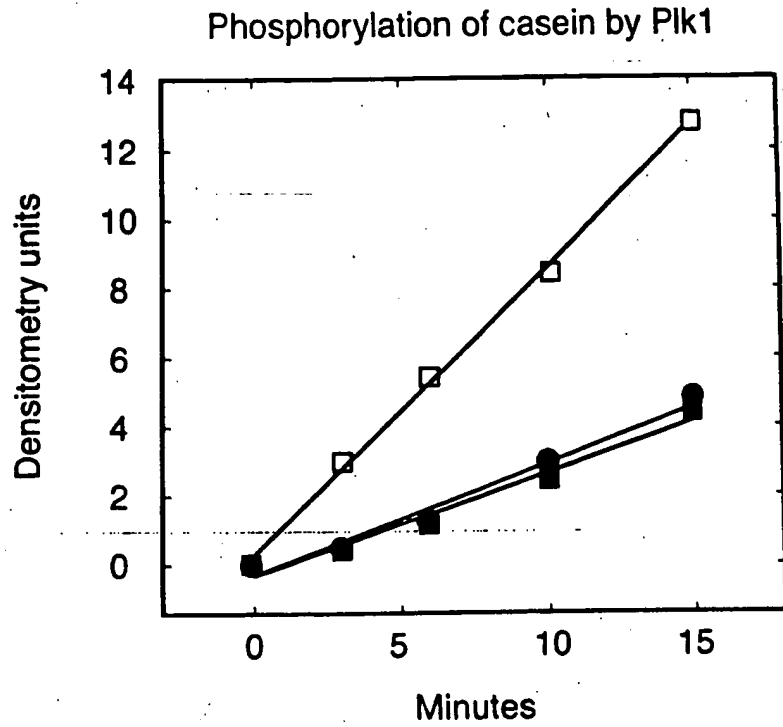


Figure 15

**A**



**B**



**C**

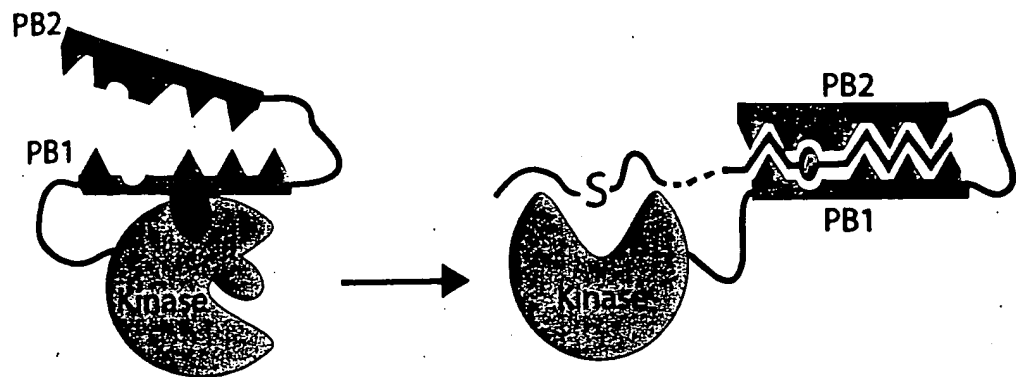
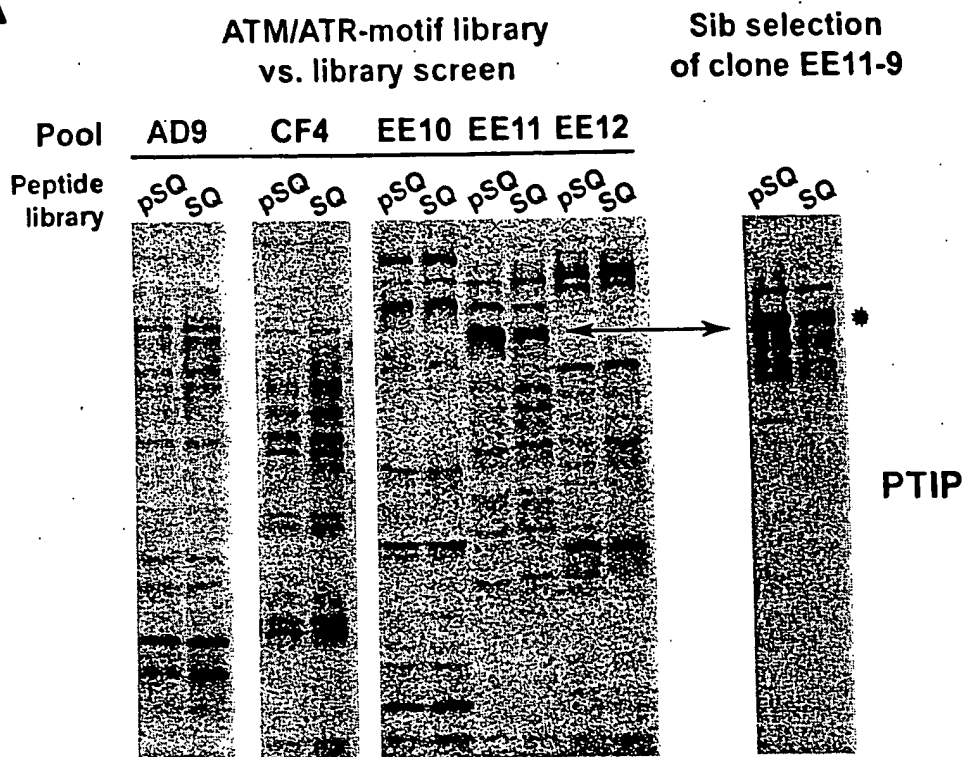


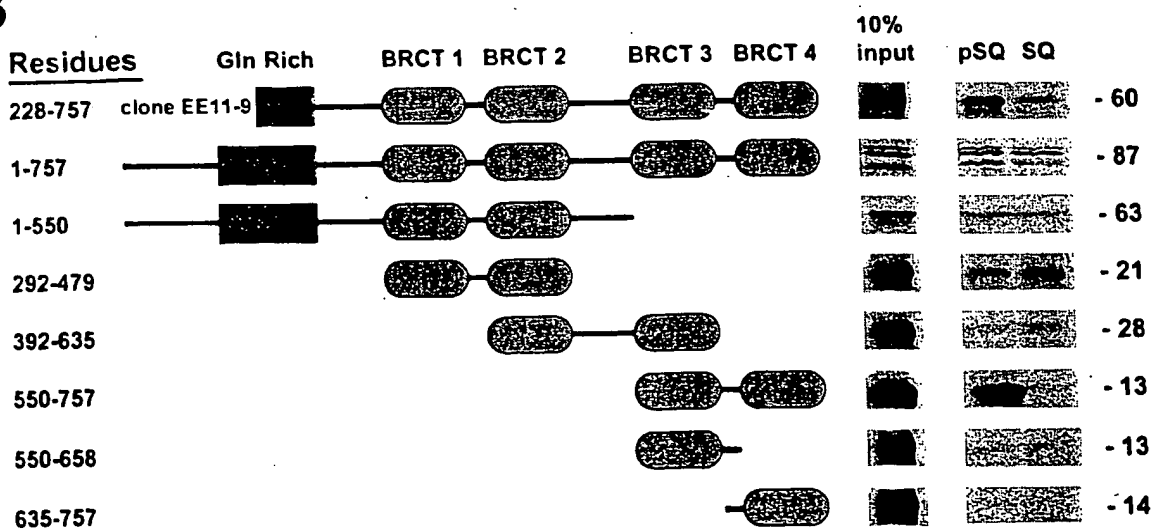
Figure 16



**A**



**B**



Manke et al., Figure 1

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Figure 17

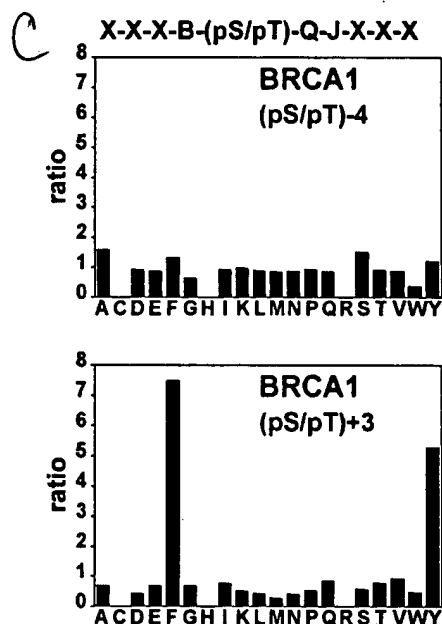
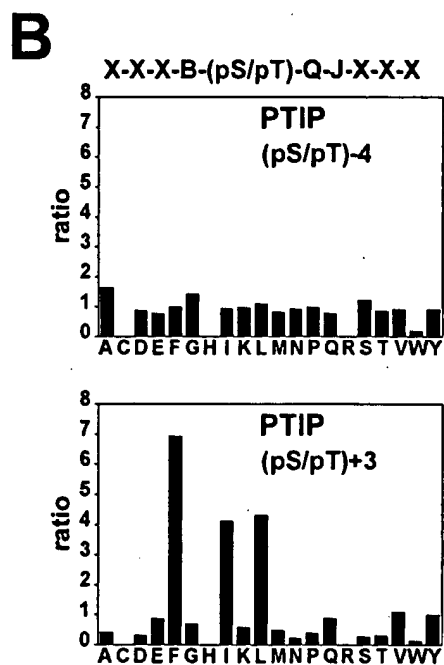
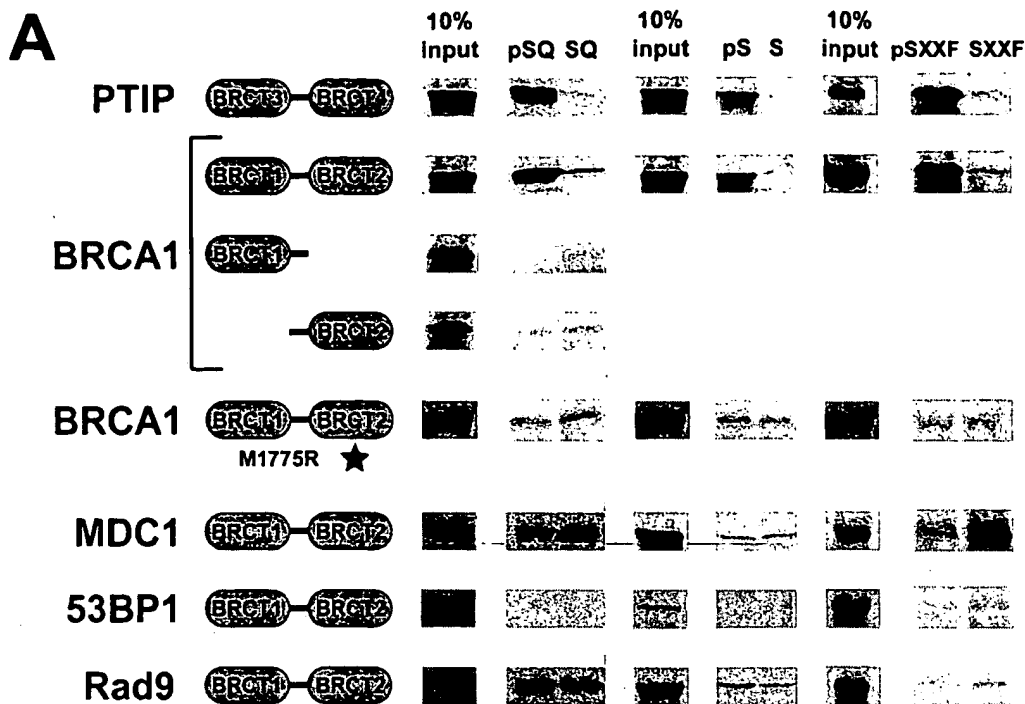
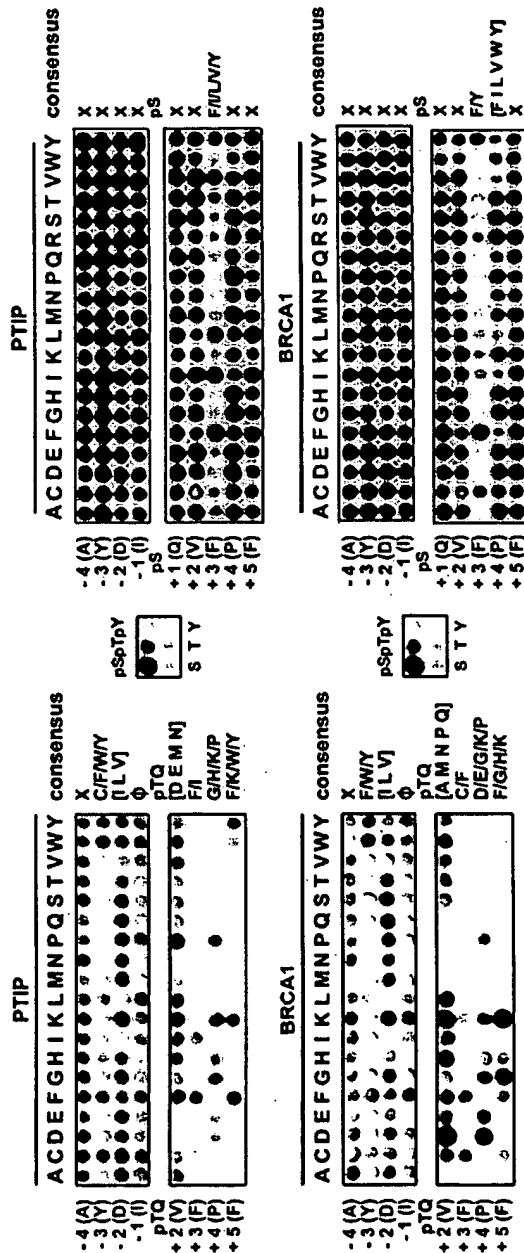
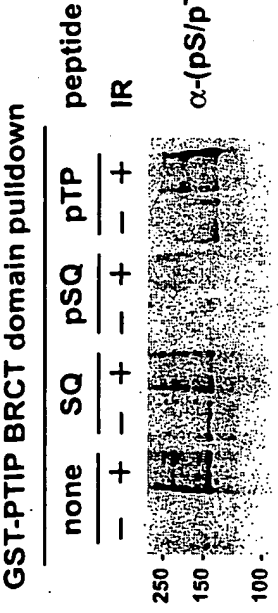


Figure 18A : 18B, 18C

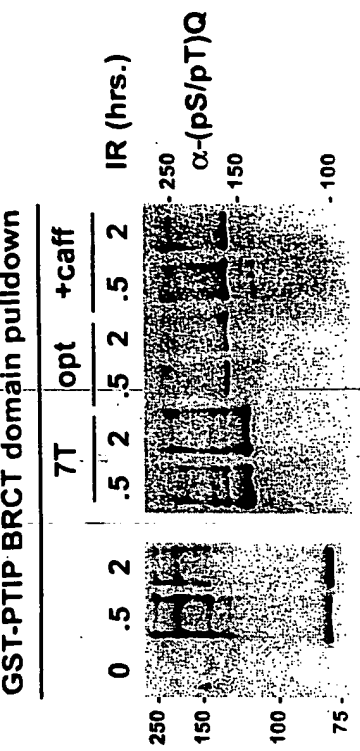


Manke et al.,

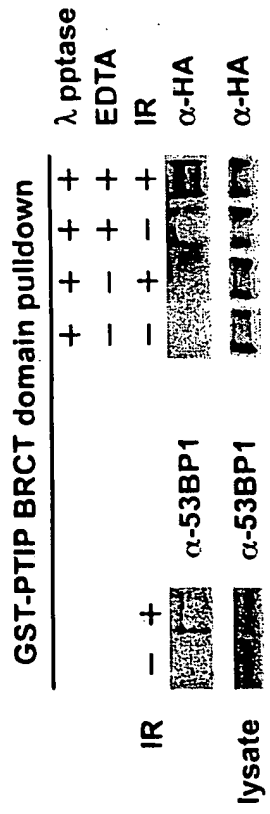
**A**



**B**



**C**



**D**

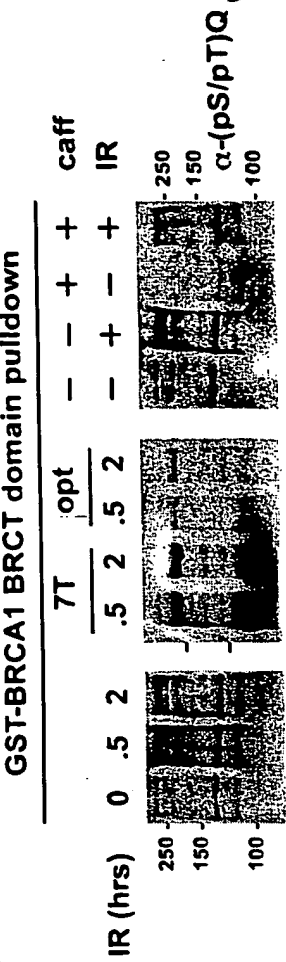


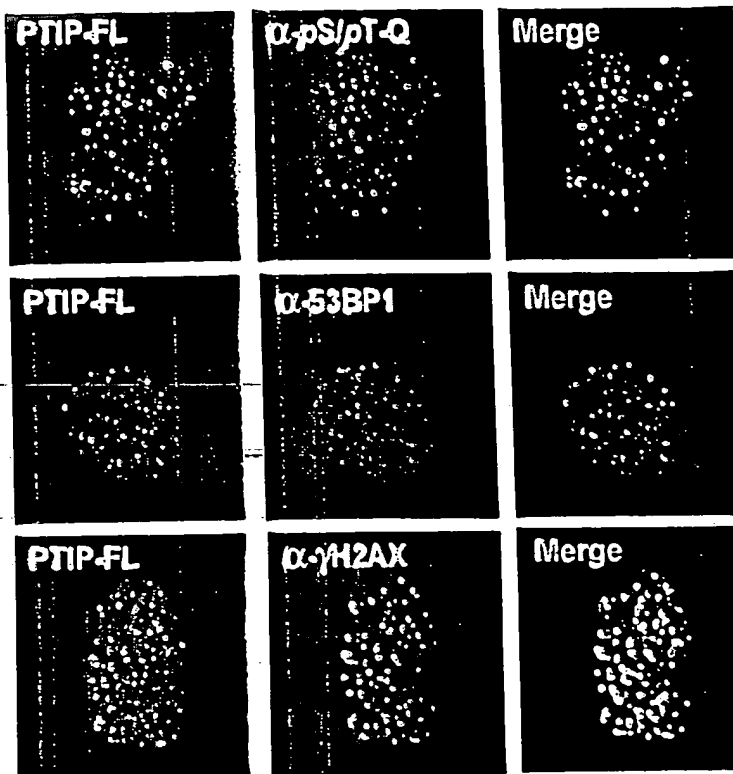
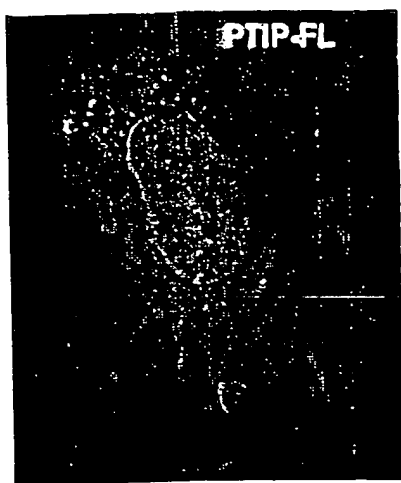
Figure 19

Manke et al., Figure 3

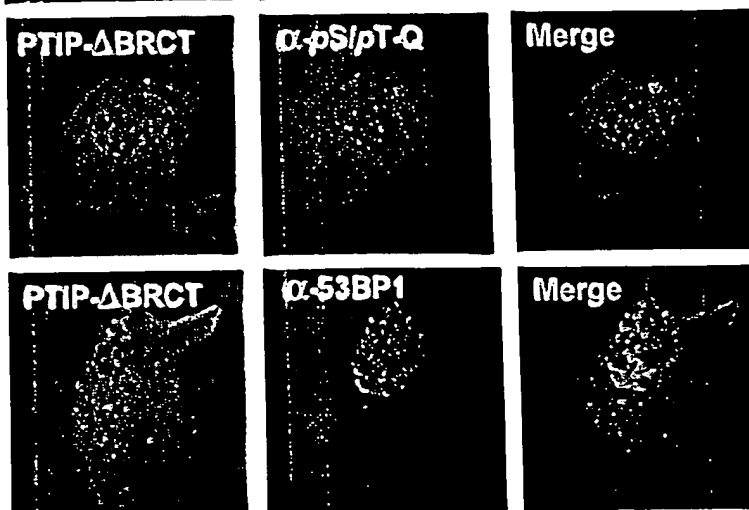
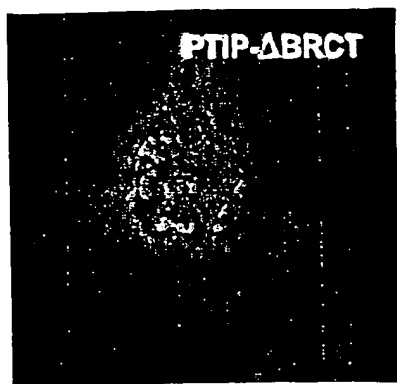
— IR

+ 10 Gy IR

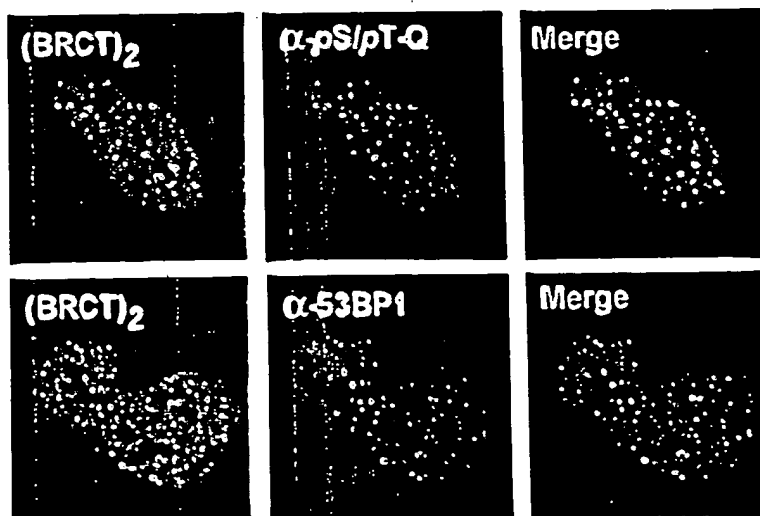
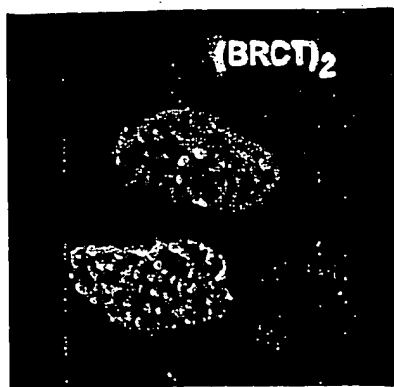
**A**

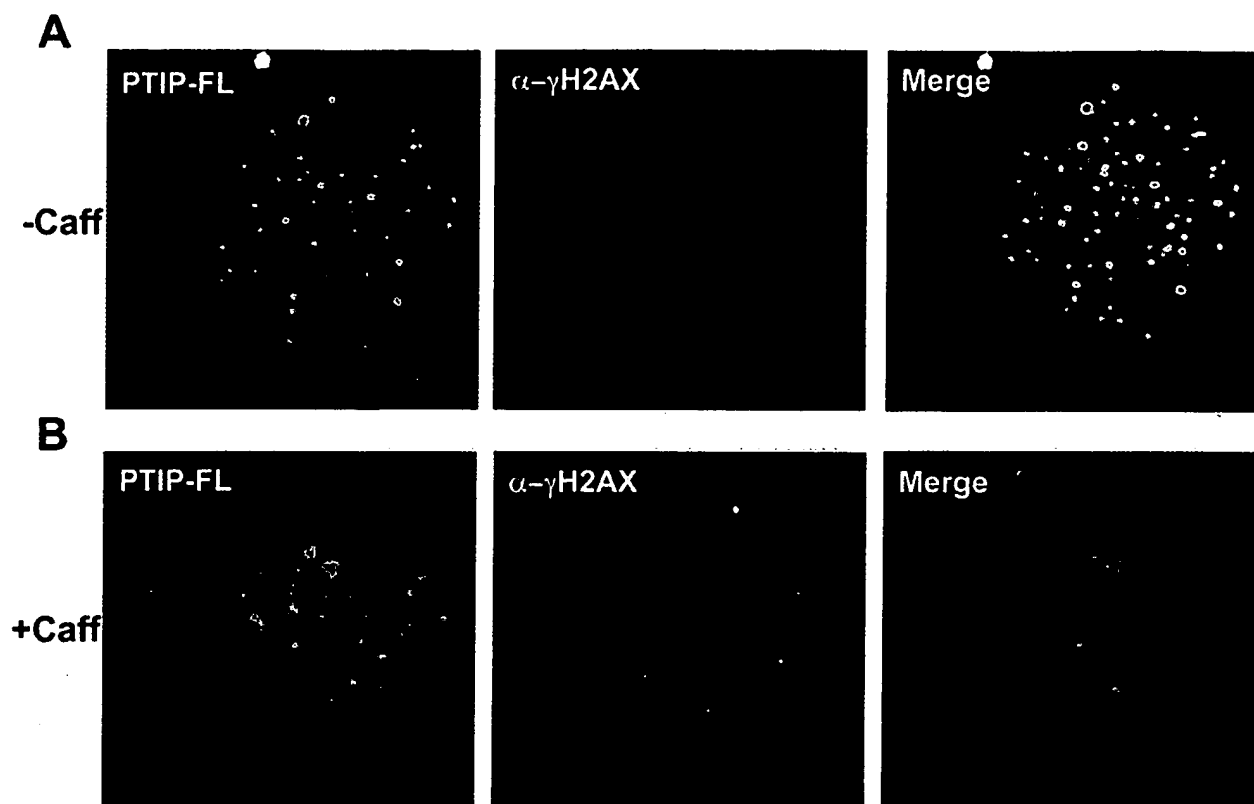


**B**



**C**





**Manke et al., Fig. S2**

Figure 21 A & 21B

Title: PRODUCTS AND PROCESSES FOR MODULATING  
PEPTIDE-PEPTIDE BINDING DOMAIN INTERACTIONS

Applicants: Michael B. Yaffe et al.

Filing Date: November 14, 2003

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Serial No: Not Yet Assigned

Customer No: 21559

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**Figure 22**  
**PTIP**

>gi|21707458|gb|AAH33781.1| PAX transcription activation domain interacting protein 1 like  
[Homo sapiens]

MAAGQNLQSSERSEMIATWSPAVRTLNRITNNADIQQMNRPSNVAHILQTLSPATKNLEQQVNH  
SQQGHTNANAVLFSQVKVTPETHMLQQQQQAQQQQQHPVLHLQPQQIMQLQQQQQQQISQ  
QPYPQQPPHPFSQQQQQQQQAHPHQFSQQQLQFPQQQLHPPQQQLHRPQQQLQPFQQQHAL  
QQQFHQLQQHQLQQQQLAQLQQQHSLQQQQQQQIQQQQLQRMHQQQQQQQMQSQTAPH  
LSQTSQALQHQPVPQQPPQQQQQQQPPSPQQHQLFGHDPAVEIPEEGFLLGCVFAIADYPEQ  
MSDKQLLATWKRIIQAHGTVDPFTTSRCTHLLCESQVSSAYAQAIRERKRCVTAHWLNTVLKK  
KKMVPPHRALHFPVAFPPGGKPCSQHIIISVTGFVDSRDDLKLMAYLAGAKYTGYLCSRNTVLIC  
KEPTGLKYEKAKEWRIPCNAQWLGDILLGNFEALRQIQYSRYTAFSLQDPFAPTQHLVLNLLDA  
WRVPLKVSAELLMSIRLPPKLKQNEVANVQPSSKRARIEDVPPPTKKLTPELTPFVLFTGFEPVQ  
VQQYIKKLYILGGEVAESAQKCTHLIASKVTRTVKFLTAISVVKHIVTPEWLEECFRCQKFIDEQNYI  
LRDAEAEVLFSFSLEESLKRAHVSPLFKAKYFYITPGICPSLSTMKAIVECAGGKVLKQPSFRKL  
MEHKQNSSLSEIILISCENDLHLCREYFARGIDVHNAEFVLTGVLTQTLDYESYKFN

ATGGCTGCTGGACAAACCTCCAAAGTTCTGAAAGATCAGAAATGATAGCTACCTGGAGTCC  
AGCTGTACGGACACTGAGGAATATTACTAATAATGCTGACATTCAGCAGATGAACCGGCCAT  
CAAATGTAGCACATATCTTACAGACTCTTTCAGCACCTACGAAAAATTTAGAACAGCAGGTGA  
ATCACAGCCAGCAGGGACATACAAATGCCAATGCAGTGTCTGTTTAGCCAAGTGAAAGTGACT  
CCAGAGACACACATGCTACAGCAGCAGCAGCAGGCCCAGCAGCAGCAGCAGCAGCACCCG  
GTTTTACACCTTCAGCCCCAGCAGATAATGCAGCTCCAGCAGCAGCAGCAGCAGCAGATCT  
CTCAGCAACCTTACCCCCAGCAGCCGCCGCATCCATTTTCACAGCAACAGCAGCAGCAGCA  
GCAAGCCCATCCGCATCAGTTTTTCACAGCAACAGCTACAGTTTCCACAGCAACAGTTGCATC  
CTCCACAGCAGCTGCATCGCCCTCAGCAGCAGCTCCAGCCCTTTCAGCAGCAGCATGCCCT  
GCAGCAGCAGTTCATCAGCTGCAGCAGCACCAGCTCCAGCAGCAGCAGCTCGCCAGCT  
CCAGCAGCAGCACAGCCTGCTCCAGCAGCAGCAGCAACAGCAGATTCAGCAGCAGCAGCT  
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GAGTCAGACGTACAGGCGCTGCAGCATCAGGTTCCACCTCAGCAGCCCCCGCAGCAGCA  
GCAGCAACAGCAGCCACCACCATCGCCTCAGCAGCATCAGCTTTTTGGACATGATCCAGCA  
GTGGAGATTCCAGAGAAGGCTTCTTATTGGGATGTGTGTTTGAATTGCGGATTATCCAGA  
GCAGATGTCTGATAAGCAACTGCTGCCACCTGGAAAAGGATAATCCAGGCACATGGCGGC  
ACTGTTGACCCACCTTCACGAGTGCATGACGACGACCTTCTGTGAGAGTCAAGTCAGCA  
GCGCGTATGCACAGGCAATAAGAGAAAGAAAGAGATGTGTTACTGCACACTGGTTAAACACA  
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AGAGATGACCTAAAATTAATGGCTTATTTGGCAGGTGCCAAATATACGGGTTATCTATGCCG  
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ACCCCTTTTGTGCTTTTCACTGGATTGAGCCTGTCCAGGTTCAACAGTATATTAAGAAGCTC  
TACATTCTTGGTGGAGAGGTTGCGGAGTCTGCACAGAAGTGCACACACCTCATTGCCAGCA  
AAGTGACTCGCACCGTGAAGTTCCTGACGGCGATTTCTGTCGTGAAGCACATAGTGACGCC  
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GAGATGCTGAGGCAGAACTACTTTTCTCTTTCAGCTTGAAGAATCCTTAAAACGGGCACAC  
GTTTCTCCACTCTTTAAGGCAAAATATTTTACATCACACCTGGAATCTGCCAAGTCTTTCC  
ACTATGAAGGCAATCGTAGAGTGTGCAGGAGGAAAGGTGTTATCCAAGCAGCCATCTTCC  
GGAAGCTCATGGAGCACAAGCAGAACTCGAGTTTGTGCGAAATAATTTAATATCCTGTGAA  
AATGACCTTCATTTATGCCGAGAATATTTTGCCAGAGGCATAGATGTTACAATGCAGAGTTC  
GTTCTGACTGGAGTGTCTCACTCAAACGCTGGACTATGAATCATATAAGTTTAACTGA



**Figur 24**  
**Brca1**

>gi|30039659|gb|AAP12647.1| breast cancer 1, early onset [Homo sapiens]  
MDLSALRVEEVQNVINAMQKILECPICLELIKEPVSTKCDHIFCKFCMLKLLNQKKGPSQCPLCKN  
DITKRSIQESTRFSQQLVEELLKIICAFQLDTGLEAYANSYNFAKKENNSPEHLKDEVSIHQSMGYRN  
RAKRLQSEPENPSLQETSLSVQLSNLGTVRTLRQRIQPQKTSVYIELGSDSSEDTVNKATYC  
SVGDQELLQITPQGTRDEISLDSAKKAACEFSETDVTNTEHHQPSNNDLNTTEKRAAERHPEKY  
QGSSVSNLHVEPCGTNTHASSLQHENSLLLLTKDRMNVEKAFCNKSQKQPLARSQHNRWAG  
SKETCNDRRTPSTEKKVDLADPLCERKEWNKQKLPCSENPRDTEVPWITLNSSIQKVNEWFS  
RDELLGSDSDHGESESNKAVADVLDVLNEVDEYSGSSEKIDLLASDPHEALICKSERVHSKSV  
ESNIEDKIFGKTYRKKASLPNLSHVTENLIIGAFVTEPQIIQERPLTNKLKRKRRTSGLHPEDFIKK  
ADLAVQKTPEMINQGTNQTEQNGQVMNITNSGHENKTKGDSIQNEKNPNPIESLEKESAFKTKA  
EPISSSISNMELELNHNSKAPKKNRLRRKSSTRHHALELVVSRNLSPPNCTELQIDSCSSSEEIK  
KKKYNQMPVRHSRNLQLMEGKEPATGAKKSNKPNEQTSKRHDSDTFPELKLTNAPGSFTKCSN  
TSELKEFVNPSLPREEKEEKLETVKVSNAEDPKDLMLSGERVLQTERSVESSSISLVPGTDYGT  
QESISLLEVSTLGAKTEPNKCVSQCAAFENPKGLIHGCSKDNRNDETFKYPLGHEVNHRSRET  
SIEMEESELDAQYLQNTFKVSKRQSFAPFSNPGNAEEECATFSAHSGSLKKQSPKVTFECEQKE  
ENQKGKNESNIKPVQTVNITAGFPVVGQKDKPVDNAKCSIKGGSRFCLSSQFRGNETGLITPNKH  
GLLQNPYRIPPLFPIKSFVKTKCKKNLLEENFEEHSMSPEREMGNENIPSTVSTISRNNIRENVFK  
EASSSNINEVGSSSTNEVGSSINEIGSSDENIQAELGRNRGPKLNAMRLGLVLQPEVYKQSLPGSN  
CKHPEIKKQEYEEVVQTVNTDFSPYLISDNLEQPMGSSHASQVCSETPDDLDDGEIKEDTSFAE  
NDIKESSAVFSKSVQKGELSRSPSPFTHTHLAQGYRRGAKKLESSEENLSSSEDEELPCFQHLLF  
GKVNNIPSQSTRHSTVATECLSKNTEENLLSLKNSLNDCSNQVILAKASQEHHLSEETKCSASLF  
SSQCSELEDLTANTNTQDPFLIGSSKQMRHQSESQGVGLSDKELVSDDEERGTGLEENNQEEQ  
SMDSNLGEAASGCESETSVSEDCSGLSSQSDILTQQRDTMQHNLIKQQEMAELEAVLEQHG  
SQPSNSYPSIISDSSALEDLRNPEQSTSEKAVLTSQKSSEYPISQNPEGLSADKFEVSADSSTSK  
NKEPGVERSSPSKCPSLDDRWMHSCSGSLQNRNYPSEELIKVVDVEEQQLEESGPHDLTET  
SYLPRQDLEGTPYLESGLSIFSDDPESDPSEDRAPE SARVGNIPSSTSALKVPQLKVAESAQSPA  
AAHTTDTAGYNAMESVSREKPELTASTERNKRMVMVVSGLTPEEFMLVYKFARKHHITLTNLI  
TEETTHVVMKTDAEFVCERTLKYFLGIAGGKWVVSFWVTQSIKERKMLNEHDFEVRGDVVNG  
RNHQGPKRARESQDRKIFRGLICCYGPFTNMPTDQLEWMVQLCGASVVKELSSFTLGTGVHPI  
VVVQPDWATEDNGFHAIGQMCEAPVVTREWVLDSVALYQCQELDTYLIPQIPHSHY

# Figure 25

>(gil30039658:2223-2302, 10541-10594, 19804-19881, 21381-21469, 22076-22215, 26456-26561, 29046-29091, 30413-30489, 31479-34904, 35307-35395, 43771-43942, 49733-49859, 51830-52020, 55137-55447, 58682-58769, 62426-62503, 63004-63044, 69242-69325, 75264-75318, 77187-77260, 78678-78738, 80580-80704) Homo sapiens breast cancer 1, early onset (BRCA1) gene, complete cds

ATGGATTTATCTGCTCTTCGCGTTGAAGAAGTACAAAATGTCATTAATGCTATGCAGAAAATC  
 TTAGAGTGTCCCATCTGTCTGGAGTTGATCAAGGAACCTGTCTCCACAAAGTGTGACCACAT  
 ATTTTGCAAATTTTGCATGCTGAAACTTCTCAACCAGAAGAAAGGGCCTTCACAGTGTCTTT  
 ATGTAAGAATGATATAACCAAAAGGAGCCTACAAGAAAGTACGAGATTTAGTCAACTTGTTGA  
 AGAGCTATTGAAAATCATTTGTGCTTTTTCAGCTTGACACAGGTTTGGAGTATGCAAAACAGCTA  
 TAATTTTGCAAAAAAGGAAAAATAACTCTCCTGAACATCTAAAAGATGAAGTTTCTATCATCCAA  
 AGTATGGGCTACAGAAACCGTGCCAAAAGACTTCTACAGAGTGAACCCGAAAAATCCTTCCTT  
 GCAGGAAAGGAGTGTCTCAGTGTCTGAACTGTCTAAGCTTGGAACTGTGAGAACTCTGAGGACAA  
 AGCAGCGGATACAACCTCAAAAGACGTCTGTCTACATTGAATTGGGATCTGATTCTTCTGAA  
 GATACCGTTAATAAGGCAACTTATTGCAGTGTGGGAGATCAAGAATTGTTACAAATCACCCCT  
 CAAGGAACCAGGGATGAAATCAGTTTGGATTCTGCAAAAAAGGCTGCTTGTGAATTTTCTGA  
 GACGGATGTAACAAATACTGAACATCATCAACCCAGTAATAATGATTTGAACACCACTGAGAA  
 GCGTGCAGCTGAGAGGCATCCAGAAAAGTATCAGGGTAGTTCTGTTTCAAACCTTGCATGTGG  
 AGCCATGTGGCACAATACTCATGCCAGCTCATTACAGCATGAGAACAGCAGTTTATTACTC  
 ACTAAAGACAGAATAATGATGAGAAAAGGCTGAATTCTGTAATAAAAGCAAACAGCCTGGCTT  
 AGCAAGGAGCCAACATAACAGATGGGCTGGAAGTAAGGAAACATGTAATGATAGGCGGACT  
 CCCAGCACAGAAAAAAGGTAGATCTGAATGCTGATCCCCTGTGTGAGAGAAAAAGAATGGAA  
 TAAGCAGAAACTGCCATGCTCAGAGAATCCTAGAGATACTGAAGATGTTCTTGGATAACAC  
 TAAATAGCAGCATTTCAGAAAGTTAATGAGTGGTTTTCCAGAAGTGATGAACTGTTAGGTTCTG  
 ATGACTCACATGATGGGGAGTCTGAATCAAATGCCAAAGTAGCTGATGTATTGGACGTTCTA  
 AATGAGGTAGATGAATATTCTGGTTCTTCAGAGAAAAATAGACTTACTGGCCAGTGATCCTCAT  
 GAGGCTTTAATATGTAAAAGTGAAAGAGTTCCTCCAAATCAGTAGAGAGTAATATTGAAGAC  
 AAAATATTTGGGAAAACCTATCGGAAGAAGGCAAGCCTCCCCAACTTAAGCCATGTAAGTGA  
 AAATCTAATTATAGGAGCATTGTGTTACTGAGCCACAGATAATACAAGAGCGTCCCCTCACAAA  
 TAAATTAAGCGTAAAAGGAGACCTACATCAGGCCTTCATCCTGAGGATTTTATCAAGAAAGC  
 AGATTTGGCAGTTCAAAAGACTCCTGAAATGATAAATCAGGGAACCTAACCAACGGAGCAGA  
 ATGGTCAAGTGATGAATATTACTAATAGTGGTCATGAGAATAAAACAAAAGGTGATTCTATTC  
 AGAATGAGAAAAATCCTAACCCAATAGAATCACTCGAAAAAGAATCTGCTTTCAAACGAAAG  
 CTGAACCTATAAGCAGCAGTATAAGCAATATGGAACCTCGAATTAAATATCCACAATTCAAAG  
 CACCTAAAAAGAATAGGCTGAGGAGGAAGTCTTCTACCAGGCATATTCATGCGCTTGAACCTA  
 GTAGTCAGTAGAAATCTAAGCCCACCTAATTGTAAGTGAATTGCAATTGATAGTTGTTCTAGC  
 AGTGAAGAGATAAAGAAAAAAGTACAACCAATGCCAGTCAGGCACAGCAGAAACCTACA  
 ACTCATGGAAGGTAAAGAACCTGCAACTGGAGCCAAGAAGAGTAACAAGCCAAATGAACAG  
 ACAAGTAAAAGACATGACAGCGATACTTTCCAGAGCTGAAGTTAACAATGCACCTGGTTC  
 TTTTACTAAGTGTTCAAATACCAGTGAACCTAAAGAATTTGTCAATCCTAGCCTTCCAAGAGA  
 AGAAAAAGAAGAGAACTAGAAACAGTTAAAGTGTCTAATAATGCTGAAGACCCCAAGATC  
 TCATGTTAAGTGGAGAAAGGGTTTTGCAAACTGAAAGATCTGTAGAGAGTAGCAGTATTTTAT  
 TGGTACCTGGTACTGATTATGGCACTCAGGAAAGTATCTCGTTACTGGAAGTTAGCACTCTA  
 GGGAAAGGCAAAAACAGAACCAATAAATGTGTGAGTCAGTGTGCAGCATTGAAAACCCCAA  
 GGGACATGAAGTTAACCACAGTCGGGAAACAAGCATAGAAATGGAAGAAAGTGAACCTGAT  
 GCTCAGTATTTGCAGAAATACATTCAAGGTTTTCAAGCGCCAGTCATTTGCTCCGTTTTCAAAT  
 CCAGGAAATGCAGAAGAGGAATGTGCAACATTCTCTGCCACTCTGGGTCCTTAAAGAAACA  
 AAGTCCAAAAGTCACTTTTGAATGTGAACAAAAGGAAGAAATCAAGGAAAGAATGAGTCTAA  
 TATCAAGCCTGTACAGACAGTTAATATCACTGCAGGCTTTTCTGTGGTTGGTCAGAAAGATA  
 AGCCAGTTGATAATGCCAAATGTAGTATCAAAGGAGGCTCTAGGTTTTGTCTATCATCTCAGT  
 TCAGAGGCAACGAACTGGACTCATTACTCCAAATAAACATGGACTTTTACAAAACCCATATC  
 GTATACCACCACTTTTCCCATCAAGTCATTTGTTAAACTAAATGTAAGAAAAATCTGCTAGA  
 GGAAACTTTGAGGAACATTCAATGTCACCTGAAAGAGAAATGGGAAATGAGAACATTCCAA  
 GTACAGTGAGCACAATTAGCCGTAATAACATTAGAGAAAATGTTTTTAAAGAAGCCAGCTCAA

GCAATATTAATGAAGTAGGTTCCAGTACTAATGAAGTGGGCTCCAGTATTAATGAAATAGGTT  
CCAGTGATGAAAACATTCAAGCAGAACTAGGTAGAAACAGAGGGCCAAAATTGAATGCTATG  
CTTAGATTAGGGGTTTTGCAACCTGAGGTCTATAAACAAAGTCTTCCTGGAAGTAATTGTAAG  
CATGCTGAAATAAAAAAGCAAGAATATGAAGAAGTAGTTCAGACTGTAAATACAGATTTCTCT  
CCATATCTGATTTTCAGATAACTTAGAACAGCCTATGGGAAGTAGTCATGCATCTCAGGTTTGT  
TCTGAGACACCTGATGACCTGTTAGATGATGGTGAATAAAGGAAGATACTAGTTTTGCTGA  
AAATGACATTAAGGAAAGTTCTGCTGTTTTTAGCAAAAGCGTCCAGAAAGGAGAGCTTAGCA  
GGAGTCCTAGCCCTTTCACCCATACACATTTGGCTCAGGGTTACCGAAGAGGGGGCCAAGAA  
ATTAGAGTCCTCAGAAGAGAACTTATCTAGTGAGGATGAAGAGCTTCCCTGCTTCCAACACT  
TGTTATTTGGTAAAGTAAACAATATACCTTCTCAGTCTACTAGGCATAGCACCGTTGCTACCG  
AGTGTCTGTCTAAGAACACAGAGGAGAATTTATTATCATTGAAGAATAGCTTAAATGACTGCA  
GTAACCAGGTAATATTGGCAAAGGCATCTCAGGAACATCACCTTAGTGAGGAAACAAAATGT  
TCTGCTAGCTTGTTTTCTTCACAGTGCAAGTGAATTGGAAGACTTGACTGCAAATACAAACACC  
CAGGATCCCTTCTTGATTGGTCTTCCAAACAAATGAGGCATCAGTCTGAAAGCCAGGGAGT  
TGGTCTGAGTGACAAGGAATTGTTTTAGATGATGAAGAAAGAGGAACGGGCTTGGAAGAA  
AATAATCAAGAAGAGCAAAGCATGGATTCAAACCTTAGGTGAAGCAGCATCTGGGTGTGAGAG  
TGAAACAAGCGTCTCTGAAGACTGCTCAGGGCTATCCTCTCAGAGTGACATTTTAACCACTC  
AGCAGAGGGATACCATGCAACATAACCTGATAAAGCTCCAGCAGGAAATGGCTGAAGTGA  
AGCTGTGTTAGAACAGCATGGGAGCCAGCCTTCTAACAGCTACCCTTCCATCATAAGTGACT  
CTTCTGCCCTTGAGGACCTGCGAAATCCAGAACAAAGCACATCAGAAAAAGCAGTATTAAC  
TCACAGAAAAGTAGTGAATACCCTATAAGCCAGAATCCAGAAGGCCTTCTGCTGACAAGTT  
TGAGGTGTCTGCAGATAGTTCTACCAGTAAAAATAAAGAACCAGGAGTGGAAGGTCATCCC  
CTTCTAAATGCCCATCATTAGATGATAGGTGGTACATGCACAGTTGCTCTGGGAGTCTTCAG  
AATAGAACTACCCATCTCAAGAGGAGCTCATTAAAGGTTGTTGATGTGGAGGAGCAACAGCT  
GGAAGAGTCTGGGCCACACGATTTGACGGAAACATCTTACTTGCCAAGGCAAGATCTAGAG  
GGAACCCCTTACCTGGAATCTGGAATCAGCCTCTTCTCTGATGACCCTGAATCTGATCCTTC  
TGAAGACAGAGCCCCAGAGTCAGCTCGTGTGGCAACATACCATCTTCAACCTCTGCATTGA  
AAGTTCCCCAATTGAAAGTTGCAGAATCTGCCAGAGTCCAGCTGCTGCTCATACTACTGAT  
ACTGCTGGGTATAATGCAATGGAAGAAAGTGTGAGCAGGGAGAAGCCAGAATTGACAGCTT  
CAACAGAAAGGGTCAACAAAAGAATGTCCATGGTGGTGTCTGGCCTGACCCCAGAAGAATTT  
ATGCTCGTGTACAAGTTTGGCAGAAAACACCACATCACTTTAACTAATCTAATTACTGAAGAG  
ACTACTCATGTTGTTATGAAAACAGATGCTGAGTTTGTGTGTGAACGGACACTGAAATATTTT  
CTAGGAATTGCGGGAGGAAAAATGGGTAGTTAGCTATTTCTGGGTGACCCAGTCTATTAAAGA  
AAGAAAAATGCTGAATGAGCATGATTTTGAAGTCAGAGGAGATGTGGTCAATGGAAGAAACC  
ACCAAGGTCCAAAGCGAGCAAGAGAATCCCAGGACAGAAAGATCTTCAGGGGGGCTAGAAAT  
CTGTTGCTATGGGCCCTTACCAACATGCCACAGATCAACTGGAATGGATGGTACAGCTGT  
GTGGTGCTTCTGTGGTGAAGGAGCTTTCATCATTACCCCTTGGCACAGGTGTCCACCCAATT  
GTGGTTGTGCAGCCAGATGCCTGGACAGAGGACAATGGCTTCCATGCAATTGGGCAGATGT  
GTGAGGCACCTGTGGTGACCCGAGAGTGGGTGTTGGACAGTGTAGCACTCTACCAGTGCCA  
GGAGCTGGACACCTACCTGATACCCAGATCCCCACAGCCACTACTGA

Fig 25 (cont'd)

**Figure 26**  
**MDC1**

>gi|7661966|ref|NP\_055456.1| MDC1 mediator of DNA damage checkpoint 1; nuclear factor with BRCT domains protein 1; Em:AB023051.5 [Homo sapiens]  
MEDTQAIDWDVEEEEEETEQSSESLRCNVEPVGRLHIFSGAHGPEKDFPLHLGKNVVGRMPDCS  
VALPFPSISKQHAEIEILAWDKAPILRDCGSLNGTQILRPPKVLSPGVSHRLRDQELILFADLLCQY  
HRLDVSLPFVSRGPLTVEETPRVQGETQPQRLLLAEDSEEEVDFLSERRMVKKSRTTSSSVIVPE  
SDEEGHSPVLGGLGPPFAFNLSDDTVEEGQQPATEEASSAARRGATVEAKQSEAEVVTEIQLE  
KDQPLVKERDNDTKVKRGAGNGVVPAGVILERSQPPGEDSDTDVDDDSRPPGRPAEVHLERAQ  
PFGFIDSDTDAEEERIPATPVVPMKKRKIFHGVGTRGPGAPGLAHLQESQAGSDTDVEEGKAPQ  
AVPLEKSQASMVINSDDTDEEEVSAALTLAHLKESQPAIWNRAEEDMPQRVLLQRSQTTER  
DSDTDVEEEELPVENREAVLKDHTKIRALVRAHSEKDQPPFGSDSDSVEADKSSPGIHLERSQA  
STTVDDINTQVEKEVPPGSAIMHIKKHQVSVEGTNQTDVKAVGGPAKLLVVSLEEAWPLHGDCE  
DAEEGTSLTASVVADVRKSQLPAEGDAGAEWAAAVLKQERAHEVGAQGGPPVAQVEQDLPIR  
ENLTDLVVDLTLGESTQREGAQVPTGREREQHVGGTKDSEDNYGSEDLDLQATQCFLN  
QGLEAVQSMEDPTQAFMLTPPQELGSPHCSFQTTGTLDEPWEVLATQPFCLRESEDSETQPF  
DTHLEAYGPCLSPRAIPGDQHPESPVHTEPMGIQGRGRQTVDKVMGIPKETAERVGPERGPLE  
RETEKLLPERQTDVTGEEELTKGKQDREQKQLLARDTQRQESDKNGESASPERDRESLKVEIET  
SEEIQEKQVQKQTLPSKAFFEREVERPVANRECDPAELEEKVPKVILERDTQRGEPEGGSQDQKG  
QASSPTPEPGVGAGDLPGPTSAPVPSGSQSGGRGSPVSPRRHQKGLLNCKMPPAEKASRIAA  
EKVSRGDQESPDACLPPAVPEAPAPPQKPLNSQSQKHLAPPPLSPLLPSIKPTVRKTRQDGSQ  
EAPPEPLSSELEPFHHPKPKIRTRKSSRMTPFPATSAAPEHPSTSTAQPVT PKPTSQATRSTNR  
SSVKTPEPVVPTAPELQPSTSTDQPV TSEPTSQVTRGRKSRSSVKT PETVVPTAELQ PSTSTD  
RPVTSEPTSQATRGRKNRSSVKTPEPVVPTAPELQPSTSTDQPV TSEPTYQATRGRKNRSSVKT  
PEPVVPTAPELRPSTSTD RPVT PKPTSRTTRSR TNMSSVKT PETVVPTAPELQISTSTDQPVTPK  
PTSRTTRSR TNMSSVKNPESTVPIAPELPPSTSTEQPV TPEPTS RATRGRKNRSSGKT PETLVPT  
APKLEPSTSTDQPV TPEPTSQATRGR TNRSSVKT PETVVPTAPELQPSTSTDQPV TPEPTSQAT  
RGRTDRSSVKT PETVVPTAPELQASASTDQPV TSEPTSRTTRGRKNRSSVKT PETVVPAPELQ  
PPTSTDRPV TPEPTS RATRGR TNRSSVKT PESIVPIAPELQPSTSRNQLV TPEPTS RATRCRTNR  
SSVKTPEPVVPTAPEPHPTTSTDQPVTPKLT SRATRRK TNRSSVKT PKPVEPAASDLEPFTPTDQ  
SVTPEAIAQGGQSKTLRSSTVRAMPVPTTPEFQSPVTTDQPISEPITQPSCIQRQAAGNPGSL  
AAPIDHKPCSAPLEPKSQASRNQRWGAVRAAESLTAIPEPASPQLLETPIHASQIQKVEPAGRSR  
FTP ELQPKASQSRKSLATMDSPPHQKQPQRGEVSQKTVIIKEEEEDTAEKPGKEEDVVTPKPG  
KRKRDQAE EEPNRIPSRSLRRTKLNQESTAPKVLFTGVVDARGERAVLALGGS LAGSAAEASHL  
VTDRI RRTVKFLCALGRGIPILSLDWLHQSRKAGFFLPDEYVVDPEQEKNFGFSLQDALSRAR  
ERRLLEGYEIYVTPGVQPPPPQMGEIISCCGGTYLPSMPRSYKQQRVVITCPQDFPHCSIPLRVG  
LPLLSPEFLLTGVLKQEAKEAFVLSPLEMSST

**Figure 27**

>gi|7661965:14-6283 Homo sapiens mediator of DNA damage checkpoint 1 (MDC1), mRNA  
ATGGAGGACACCCAGGCTATTGACTGGGATGTTGAAGAAGAGGAGGAGACAGAGCAATCCA  
GTGAATCCTTGAGGTGTAACGTGGAGCCAGTAGGGCGGCTACATATCTTTAGTGGTGCCCA  
TGGACCAGAAAAAGATTTCCCACTACACCTCGGGAAGAATGTGGTAGGCCGAATGCCTGAC  
TGCTCTGTGGCCCTGCCCTTTCCATCTATCTCCAAACAACATGCAGAGATTGAAATCTTAGC  
CTGGGACAAGGCACCTATCCTCCGAGACTGTGGGAGCCTTAATGGTACTCAAATCCTGAGA  
CCTCCTAAGGTTTTGAGCCCTGGGGTGAGTCACCGTCTGAGGGACCAGGAATTGATTCTCTT  
TGCTGACTTGCTCTGCCAGTACCATCGCCTGGATGTCTCTCTGCCCTTTGTCTCCCGGGGC  
CCTCTGACAGTAGAAGAGACACCCAGAGTACAGGGAGAACTCAACCCAGAGGGCTTCTGT  
TGGCTGAGGACTCGGAGGAGGAAGTAGATTTTCTTTCTGAAAGGCGTATGGTAAAAAATCA  
AGGACCACATCTTCCTCTGTGATAGTTCCAGAGAGTGATGAAGAGGGGCATTCCCCGGTCC  
TGGGCGGCCCTTGGGCCGCCCTTTGCCCTCAATTTGAACAGTGACACAGATGTGGAAGAAGG  
TCAGCAACCAGCCACAGAGGAGGCCT.CCT.CAGCT.GCCAGAAGAGGTGCCACTGTAGAGGC  
AAAGCAGTCTGAAGCTGAAGTTGTAAGTGAATCCAGCTTGAAAAGGATCAGCCTTTAGTGA  
AGGAGAGGGACAATGATACAAAAGTCAAGAGGGGTGCAGGGAATGGGGTGGTTCCAGCTG  
GGGTGATTCTGGAGAGGAGCCAACTCCTGGAGAGGACAGTGACACAGATGTGGATGATGA  
CAGCAGGCCTCCTGGAAGGCCAGCTGAGGTCCATTTGAAAGGGCTCAGCCTTTTGGCTTC  
ATCGACAGCGACACTGATGCGGAAGAAGAGAGGATCCCAGCAACCCAGTTGTCAATTCCTA  
TGAAGAAGAGGAAGATCTTCCATGGAGTAGGTACAAGGGGTCTGGAGCACCAGGCCTGG  
CCCATCTGCAGGAGAGCCAGGCTGGTAGTGATACAGATGTGGAAGAAGGCAAGGCCCCAC  
AGGCTGTCCCTCTGGAGAAAAGCCAAGCTTCCATGGTTATCAACAGCGATACAGATGACGA  
GGAAGAAGTCTCAGCAGCGCTGACTTTGGCACATCTGAAAGAGAGCCAGCCTGCTATATGG  
AACAGAGATGCAGAAGAGGACATGCCCCAACGTGTGGTCTTCTGCAGCGAAGCCAAACCA  
CCACTGAGAGAGACAGTGACACAGACGTGGAGGAGGAAGAGCTCCCAGTGGAAAATAGAG  
AAGCTGTCCTCAAGGATCACACAAAGATTAGAGCCCTTGTAGAGCACATTCAGAAAAGGAC  
CAACCTCCTTTTGGGGACAGTGATGACAGTGTGGAAGCAGATAAGAGCTCACCTGGGATCC  
ACCTGGAGAGAAGCCAAGCCTCCACCACAGTGGACATCAACACACAAGTGGAGAAGGAAGT  
CCCGCCAGGGTCAGCCATTATGCATATAAAGAAGCATCAGGTGTCTGTGGAGGGGACAAAT  
CAAACAGATGTGAAAGCAGTTGGGGGACCAGCAAAGCTGCTTGTGGTATCTCTAGAGGAAG  
CCTGGCCTCTGCATGGGGACTGTGAAACAGATGCAGAGGAGGGCACCTCCCTAACAGCCTC  
AGTAGTTGCAGATGTAAGAAAGAGCCAGCTTCCAGCAGAAGGGGATGCTGGGGCAGAGTG  
GGCTGCAGCTGTTCTTAAGCAGGAGAGAGCTCATGAGGTGGGGGCCAGGGTGGGCCACC  
TGTGGCACAAGTGGAGCAGGACCTCCCTATCTCAAGAGAGAACCTCACAGATCTGGTGGTG  
GACACAGACACTCTAGGGGAATCCACCCAGCCACAGAGAGAGGGAGCCAGGTCCCCACA  
GGAAGGGAGAGAGAACAACATGTGGGTGGGACCAAGGACTCTGAAGACAATATGGTGATT  
CTGAAGATCTGGACCTACAAGCTACCCAGTGCTTTCTGGAGAATCAGGGCCTGGAAGCAGT  
CCAGAGCATGGAGGATGAACCTACCCAGGCCTTCATGTTGACTCCACCCCAAGAGCTTGGC  
CCTTCCCATTCAGCTTCCAGACAACAGGTACCCTAGATGAACCATGGGAGGTCTGGCTA  
CACAGCCATTCTGTCTGAGAGAGTCTGAGGACTCTGAGACCCAGCCTTTTGACACGCACCTT  
GAGGCCTATGGACCTTGCCTGTCTCCACCTAGGGCAATACCAGGAGACCAACATCCAGAGA  
GCCCAGTTACACAGAGCCAATGGGGATTCAAGGCAGAGGGGAGGCAGACTGTGGATAAAGT  
CATGGGTATACCAAAAAGAAACAGCAGAGAGGGTGGGCCCTGAGAGAGGGCCATTGGAGAG  
AGAAACTGAGAAACTGCTACCAGAAAGACAGACAGATGTGACAGGAGAGGGAAGAAATTAACC  
AAGGGGAAACAGGACAGAGAACAACAAACAGTTGTTAGCTAGAGACACCCAGAGACAAGAAT  
CTGACAAAAATGGGGAAAGTGCAAGTCTGAAAGAGATAGGGAGAGTTTGAAGGTAGAAATT  
GAGACATCTGAGGAAATACAAGAGAAACAAGTACAGAAGCAGACCCTTCCAAGCAAAGCATT  
TGAGAGAGAAGTAGAGAGACCAGTAGCAAACAGAGAGTGCGATCCAGCCGAGTTAGAAGAG  
AAGGTGCCCAAAGTGATCCTGGAGAGAGATACACAGAGAGGGGAGCCAGAGGGAGGGAGC  
CAGGACCAGAAAGGGCAGGCCTCCAGCCCAACACCAGAGCCTGGGGTGGGGGCGGGGGA  
CCTTCCGGGACCTACCTCAGCCCCCGTACCTTCTGGGAGCCAGTCAGGTGGAAGGGGATC  
CCCAGTGAGCCCCAGGAGGCATCAGAAAGGCCTCCTGAATTGCAAGATGCCACCTGCTGAG  
AAGGCTTCCAGGATCAGAGCTGCTGAGAAGGTTTCCAGGGGCGATCAGGAATCTCCAGATG  
CTTGTCTGCCTCCTGCAGTACCTGAAGCCCCAGCCCCACCCCAAAAGCCCCCTTAAGTCTCA  
GAGCCAGAAACATCTTGCACCTCCGCCCTTCTTTCTCCCTTTTACCTTCTATCAAGCCAAC  
CGTTCGTAAGACCAGGCAAGATGGGAGTCAGGAAGCTCCAGAGGCTCCCTTGTCTCAGAG

CTGGAGCCTTTCCACCCAAAGCCTAAAATTAGAACTCGGAAGTCCTCCAGAATGACACCCTT  
TCCAGCTACCTCTGCTGCCCCCTGAGCCCCACCCTTCCACCTCCACAGCCCAGCCAGTCACT  
CCCAAGCCCACATCTCAGGCCACTAGGAGCAGGACAAATAGGTCTCTGTCAAGACCCCTG  
AACCAGTTGTCCCCACAGCCCCCTGAGCTCCAGCCTTCCACCTCCACAGACCAGCCTGTCAC  
CTCTGAGCCCACATCTCAGGTTACTAGGGGAAGAAAAAGTAGATCCTCTGTCAAGACCCCTG  
AAACAGTTGTGCCACAGCCCCCTGAGCTCCAGCCTTCCACCTCCACCGACCGACCTGTCAC  
CTCTGAACCCACCTCTCAGGCTACTAGGGGAAGAAAAAATAGATCCTCTGTCAAGACCCCTG  
AACCAGTTGTCCCCACAGCCCCCTGAGCTCCAGCCTTCCACCTCCACAGACCAGCCTGTCAC  
TTCTGAGCCCACATATCAGGCTACTAGGGGAAGAAAAAATAGATCCTCTGTCAAGACCCCTG  
AACCAGTTGTGCCACAGCCCCCTGAGCTCCGGCCTTCCACCTCCACAGACCAGCCTGTCAC  
CCCCAAGCCCACATCTCGGACCACTAGGAGCAGGACAAATATGTCCTCTGTCAAGACCCCT  
GAAACAGTTGTCCCCACAGCCCCCTGAGCTCCAGATTTCCACCTCCACAGACCAACCTGTCAC  
CCCTAAGCCCACATCTCGGACCACTAGGAGCAGGACAAATATGTCCTCTGTGAAGAACCCT  
GAATCAACTGTCCCTATAGCCCCCTGAGCTCCACCTTCCACCTCCACAGAGCAGCCTGTCAC  
CCCTGAGCCCACATCTCGGGCTACTAGGGGAAGAAAAAATAGATCCTCTGGCAAGACCCCT  
GAAACACTTGTCCCCACAGCCCCCTAAGCTCGAGCCTTCCACTTCCACAGACCAACCTGTCAC  
TCCTGAGCCCACATCTCAGGCCACAGGGGCAGGACAAATAGGTCTCTGTGAAGACCCCT  
GAAACAGTTGTCCCCACAGCCCCCTGAGCTCCAGCCTTCCACCTCCACAGACCAGCCTGTTA  
CCCCTGAGCCTACGTCTCAGGCTACTAGGGGAAGAACAGATAGATCCTCTGTCAAGACTCC  
TGAAACAGTTGTCCCCACAGCCCCCTGAGCTACAGGCTTCCGCCTCCACAGACCAGCCTGTC  
ACCTCTGAGCCCACATCTCGGACCACTAGGGGAAGAAAAAATCGGTCCTCTGTCAAGACCC  
CTGAAACAGTTGTGCCCGCAGCCCCCTGAGCTCCAGCCTCCACCTCCACAGACCAGCCTGT  
CACCCCTGAGCCCACATCTCGGGCCACTAGGGGCAGGACAAATAGGTCTCTGTCAAGACC  
CCTGAATCAATTGTCCCTATAGCCCCCTGAGCTTCCAGCCTTCCACCTCCAGAAACCAGCTTGT  
CACCCCTGAGCCCACATCTCGGGCCACTAGGTGCAGGACAAATAGGTCTCTGTCAAGACC  
CCTGAGCCAGTTGTCCCCACAGCCCCCTGAGCCCCATCCTACCACCTCCACAGACCAGCCTG  
TCACCCCCAAGCTCACATCTAGGGCCACTAGGAGAAAGACAAATAGGTCTCTGTCAAGACT  
CCCAAAACCAGTTGAACCAGCAGCCTCTGATCTTGAGCCTTTTACCCCCACAGACCAGTCCGT  
CACCCCTGAGGCCATAGCTCAGGGTGGTCAGAGCAAAACACTGAGGTCTTCCACAGTAAGA  
GCTATGCCGGTTCCTACCACCCCTGAATTCCAATCTCCTGTCAACACAGACCAGCCTATTTC  
CCCTGAGCCTATTACTCAACCCAGTTGCATCAAGAGGCAGAGAGCCGCTGGGAACCCCTGGC  
TCCCTCGCAGCTCCCATTTGACCATAAGCCTTGCTCTGCACCCTTGGAACCTAAATCCCAGGC  
CTCAAGGAACCAAAGATGGGGAGCAGTGAGAGCAGCTGAATCCCTTACAGCCATTCTCTGAG  
CCTGCCTCTCCCCAGCTTCTTGAGACACCAATTCATGCCTCCAGATCCAAAAGGTGGAACC  
AGCAGGTAGATCTAGGTTACCCCGGAGCTCCAGCCTAAGGCCTCTCAAAGCCGCAAGAGG  
TCTTTAGCTACCATGGATTACCAACCATCAAAAACAGCCCCAAAGAGGGGAAGTCTCCCA  
GAAGACAGTGATTATCAAGGAAGAGGAAGAAGATACTGCAGAGAAGCCAGGGAAGGAAGAG  
GATGTCGTGACTCCAAAACCAGGCAAGAGAAAGAGAGACCAGGCAGAGGAGGAGCCCAAC  
AGAATACCAAGCCGCAGCCTCCGACGGACCAAACTTAACCAAGAATCAACAGCCCCCAAAG  
TGCTCTTACAGGAGTGGTGGATGCTCGGGGAGAGCGGGCTGTGCTGGCACTGGGGGGAA  
GTCTGGCTGGTTCAGCGGCAGAGGCTTCCACCTGGTCACTGATCGCATCCGCCGGACAGT  
CAAGTTCCTGTGTGCCCTGGGGCGGGGAATCCCCATTCTGTCCCTGGACTGGCTGCATCAG  
TCCCGCAAGGCTGGTTTCTTCTTACCCCCGATGAATATGTGGTGACCGACCCTGAGCAAG  
AGAAGAACTTTGGCTTTAGCCTTCAAGACGCACTGAGCAGGGCTCGGGAGCGAAGGCTGCT  
AGAGGGCTATGAGATCTATGTGACCCCTGGAGTCCAGCCACCACCACCTCAGATGGGAGAG  
ATTATTAGCTGCTGTGGAGGCACATACCTACCCAGCATGCCTCGGTCTCTATAAGCCTCAGAG  
AGTTGTGATCACATGCCCTCAGGACTTCCCTCATTGCTCCATTCCACTACGGGTTGGGCTGC  
CCCTCCTCTCGCCTGAGTTCTCTGCTGACTGGAGTGCTGAAGCAGGAAGCCAAGCCAGAGGC  
CTTTGTCCTCTCCCCTTTGGAGATGTCATCCACCTGA

FigD (contd)

**Figure 28**  
**53BP1**

>gi|5032189|ref|NP\_005648.1| tumor protein p53 binding protein, 1; tumor protein 53-binding protein, 1; tumor protein p53-binding protein, 1 [Homo sapiens]  
MDPTGSQLDSDFSQQDTPCLIIEDSQPESQVLEDDSGSHFSMLSRHLPNLQTHKENPVLDVVS  
PEQTAGEERGDN SGFNEHLKENKVADPVDSSNLDTCGSISQVIEQLPQPNTSSVLGMSVES  
APAVEEEKGEELEQKEKEKEEDTSGNTTHSLGAEDTASSQLGFGVLELSQSQDVEENTVPYEVD  
KEQLQSVTTNSGYTRLSDVDANTAIAKHEEQSNEDIPIAEQSSKDIPVTAQPSKDVHVVKENPPP  
ARSEDMPFSPKASVAAMEAKEQLSAQELMESGLQIQKSPEPEVLSTQEDLFDQSNKTVSSDGC  
STPSREEGGCSLASTPATTLLHLLQLSGQRLVQDSLSTNSSDLVAPSPDAFRSTPFIVPSSPTEQ  
EGRQDKPMDTSVLSEEGGEFPQKKLQSGEPVELENPPLLPESTVSPQASTPISQSTPVFPPGSL  
PIPSQPQFSDHIFIPSPSLEEQSN DGKKDGMHSSSLTVECSKTSEIEPKNSPEDLGLSLTGDS  
KLMLSTSEYSQSPKMESLSSHRIDEDGENTQIEDTEPMSPVLSKVFVPAENDSILMNP AQDGEV  
QLSQND DKTKGDDTDTRDDISILATGCKGREETVAEDVCIDLTCDSGSQAVPSPATRSEALSSVL  
DQEEAMEIKEHHPEEGSSGSEVEEIPETPCESQGEELKEENMESVPLHLSLTETQSQGLCLQKE  
MPKKECSEAMEVETSVISIDSPQKLAILDQELHKEQEAWEEATSEDSSVIVDVKEPSPRVDVS  
CEPLEGVEKCSDSQSWEDIAPEIEPCAENRLDTEESVVEYEGDLKSGTAETEPVEQDSSQPSL  
PLVRADDPLRLDQELQQPQTGATPPLIGHLKLEPKRHSTPIGISNYPESTIATSDVMSESMVETHDP  
ILGSGKGDSGAAPDVDDKLCLRMKLVSPETEASEESLQFNLEK PATGERKNGSTAVAESVASPQ  
KTMSVLSCICEARQENEARSEDPPPTPIRGNLLHFPSSQGEEEEKLEGDHTIRQSQQPMKPISP  
VKDPVSPASQKMVIQGPSSPQGEAMVTDVLEDQKEGRSTNKENPSKALIERPSQNNIGIQTMEC  
SLRVPETVSAATQTIKNVCEQGTSTVDQNF GKQDATVQTERGSGEKPVSAPGDDTESLHSQGE  
EEFDMPQPPHGHVLRHMRITIREVRTLVRVITDVYYVDGTEVERKVTEETEEPIVECQECETEV  
SPSQTGGSSGDLGDISSFSSKASSLHRTSSGTSLSAMHSSGSSGKGAGPLRGKTSGETPADFA  
LPSSRGGPGKLSRPRKGVSTGTPVCEEDGDAGLGIRQGGKAPVTPRGRGRRGRPPSRTTGTR  
ETAVPGPLGIEDISPNLSPDDKSFSRVVPRVPDSTRRTDVGAGALRRSDSPEIPFQAAAGPSDGL  
DASSPGNSFVGLRVVAKWSSNGYFYSGKITRDVGAGKYKLLFDDGYECDVLGKDILLCDPIPLDT  
EVTALSEDEYFSAGVVKGHRKESGELYYSIEKEGQRKWKYKRM AVILSLEQGNRLREQYGLGPYE  
AVTPLTKAADISLDNLVEGKRKRNSVSSPATPTASSSSSTTPTRKITESPRASMGVLSGKRKLIT  
SEEERSPAKRGRKSATVKPGAVGAGEFVSPCESGDNTGEP SALEEQRGPLPLNKTFLFLGYAFL  
TMATTSDKLASRSKLPDGP TGSSSEEEEFLEIPPFNKQYTESQLRAGAGYILED FNEAQCNTAYQ  
CLLIADQHCRT RKYFLCLASGIPCVSHVWVHDSCHANQLQNYRNYLLPAGYSLEEQRILDWQPR  
ENPFQNLKVLLVSDQQQNFLELWSEILMTGGAASVKQHHSSAHNKDIALGVFDVVVTD PSCPAS  
VLKCAEALQLPVVSQEWVIQCLIVGERIGFKQHPKYKH DYVSH

**Figure 29**

>gi|5032188:174-6092 Homo sapiens tumor protein p53 binding protein, 1 (TP53BP1), mRNA  
ATGGACCCTACTGGAAGTCAGTTGGATTGAGTTTCTCTCAGCAAGATACTCCTTGCCTGAT  
AATTGAAGATTCTCAGCCTGAAAGCCAGGTTCTAGAGGATGATTCTGGTTCTCACTTCAGTAT  
GCTATCTCGACACCTTCTAATCTCCAGACGCACAAAGAAAATCCTGTGTTGGATGTTGTGT  
CCAATCCTGAACAAACAGCTGGAGAAGAACGAGGAGACGGTAATAGTGGGTTCAATGAACA  
TTTGAAAGAAAACAAGGTTGCAGACCCTGTGGATTCTTCTAACTTGGACACATGTGGTTCCAT  
CAGTCAGGTCATTGAGCAGTTACCTCAGCCAAACAGGACAAGCAGTGTCTGGGAATGTCA  
GTGGAATCTGCTCCTGCTGTGGAGGAAGAGAAGGGAGAAGAGTTGGAACAGAAGGAGAAA  
GAGAAGGAAGAAGATACTTCAGGCAATACTACACATTCCCTTGGTGTGAGATACTGCCTC  
ATCACAGTTGGGTTTTGGGGTTCTGGAAGTCTCCCAGAGCCAGGATGTTGAGGAAAATACTG  
TGCCATATGAAGTGGACAAAGAGCAGCTACAATCAGTAACCACCAACTCTGGTTATACCAGG  
CTGTCTGATGTGGATGCTAATACTGCAATTAAGCATGAAGAACAGTCCAACGAAGATATCCC  
CATAGCAGAACAGTCCAGCAAGGACATCCCTGTGACAGCACAGCCCAGTAAGGATGTACAT  
GTTGTAAGAGAGCAAAATCCACCACCTGCAAGGTGAGAGGACATGCCTTTTAGCCCCAAAGC  
ATCTGTTGCTGCTATGGAAGCAAAAGAACAGTTGTCTGCACAAGAACTTATGGAAAGTGGAC  
TGCAGATTGAGAAGTCACCAGAGCCTGAGGTTTTGTCAACTCAGGAAGACTTGTGTTGACCAG  
AGCAATAAAACAGTATCTTCTGATGGTTGCTCTACTCCTTCAAGGGAGGAAGGTGGGTGTTT  
TTTGGCTTCCACTCCTGCCACCACTCTGCATCTCCTGCAGCTCTCTGGTCAGAGGTCCCTTG  
TTCAGGACAGTCTTCCACGAATTCTTCAGATCTTGTGCTCCTTCTCCTGATGCTTCCGAT  
CTACTCCTTTTATCGTTCCTAGCAGTCCCACAGAGCAAGAAGGGAGACAAGATAAGCCAAATG  
GACACGTGAGTGTATCTGAAGAAGGAGGAGAGCCTTTTTCAGAAGAACTTCAAAGTGGTGA  
ACCAATATCTCAGAGCACACCACTCTTCCCTCCTGGGTCACTTCCATCCCAGCCTCAA  
CAGTTTCTCATGACATTTTTATTCTTCCCAAGTCTGGAAGAACAATCAAATGATGGGAAG  
AAAGATGGAGATATGCATAGTTTATCTTTGACAGTTGAGTGTCTAAAACCTCAGAGATTGAA  
CCAAAGAATTCCCCTGAGGATCTTGGGCTATCTTTGACAGGGGATTCTTGCAAGTTGATGCT  
TTCTACAAGTGAATATAGTCAGTCCCCAAAGATGGAGAGCTTGAGTTCTCACAGAATTGATG  
AAGATGGAGAAAACACACAGATTGAGGATACGGAACCCATGTCTCCAGTTCTCAATTCTAAA  
TTTGTTCTGCTGAAAATGATAGTATCCTGATGAATCCAGCACAGGATGGTGAAGTACAAC  
GAGTCAGAATGATGACAAAACAAAGGGAGATGATACAGACACCAGGGATGACATTAGTATTT  
TAGCCACTGGTTGCAAGGGCAGAGAAGAAACGGTAGCAGAAGATGTTTGTATTGATCTCACT  
TGTGATTGCGGGAGTCAGGCAGTTCCGTACCACTACTCGATCTGAGGCACCTTCTAGTGT  
GTTAGATCAGGAGGAAGCTATGGAATTAAGAACACCATCCAGAGGAGGGGTCTTCAGGG  
TCTGAGGTGGAAGAAATCCCTGAGACACCTTGTGAAAGTCAAGGAGAGGAACTCAAAGAAG  
AAAATATGGAGAGTGTTCGTTGCACCTTCTCTGACTGAAACTCAGTCCCAAGGGTGTGT  
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GTCATGGGAGGATATTGCTCCAGAAATAGAACCATGTGCTGAGAATAGATTAGACACCAAGG  
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CAGGAGTTGCAGCAGCCCCAACTCAGGAGAAAACAAGTAATTCATTAACAGAAGACTCAAA  
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GCCCATGCCTCACAAAGCTTCTGTGAAAGTTCTAGTGAAACCCCATTTTCACTTTGCCT  
AAAGAAGGTGATATCATCCCACCATGACTGGTGCAACCCACCTCTTATTGGGCACCTAAA  
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CAACCAAGTGTGATGTCTGAAAGCATGGTGAGAGCCATGATCCCATCACTTGGGAGTGG  
AAAAGGGGATTCTGGGGCTGCCAGACGTGTGATGATAAATTATGTCTAAGAATGAACTGG  
TTAGTCTGAGACTGAGGCGAGTGAAGAGTCTTTGCAAGTTCAACCTGGAAAAGCCTGCAACT  
GGTGAAAGAAAAAATGGATCTACTGCTGTTGCTGAGTCTGTTGCCAGTCCCAGAAAGACCAT  
GTCTGTGTTGAGCTGTATCTGTGAAGCCAGGCAAGAGAATGAGGCTCGAAGTGAGGATCCC  
CCCACCACACCCATCAGGGGGAACTTGCTCCACTTTCCAAGTTCTCAAGGAGAAGAGGAGA  
AAGAAAAATTGGAGGGTGACCATACAATCAGGCAGAGTCAACAGCCTATGAAGCCCATAGT  
CCTGTCAAGGACCCTGTTTCTCCTGCTTCCAGAAAGATGGTCATACAAGGGCCATCCAGTCC



TCAAGGAGAGGCCAATGGTGACAGATGTGCTAGAAGACCAGAAAGAAGGACGGAGTACTAAT  
AAGGAAAATCCTAGTAAGGCCCTTGATTGAAAGGCCAGCCAAAATAACATAGGAATCCAAAC  
CATGGAGTGTTCTTGAGGGTCCCAGAACTGTTTCAGCAGCAACCCAGACTATAAAGAATG  
TGTGTGAGCAGGGGACCAGTACAGTGGACCAGAACTTTGGAAAGCAAGATGCCACAGTTCA  
GACTGAGAGGGGGAGTGGTGAGAAACCAGTCAGTGCTCCTGGGGATGATACAGAGTCGCT  
CCATAGCCAGGGAGAAGAAGAGTTTGATATGCCTCAGCCTCCACATGGCCATGTCTTACATC  
GTCACATGAGAACAATCCGGGAAGTACGCACACTTGTCACCTCGTGTCAATTACAGATGTGTAT  
TATGTGGATGGAACAGAAAGTAGAAAGAAAAGTAACTGAGGAGACTGAAGAGCCAATTGTAGA  
GTGTCAGGAGTGTGAACTGAAGTTTCCCTTCACAGACTGGGGGCTCCTCAGGTGACCTG  
GGGGATATCAGCTCCTTCTCCTCCAAGGCATCCAGCTTACACCGCACATCAAGTGGGACAA  
GTCTCTCAGCTATGCACAGCAGTGAAGCTCAGGGAAAGGAGCCGGACCACTCAGAGGGA  
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TGCAGGCCCTTGGCATCAGACAGGGAGGGAAGGCTCCAGTCACGCCCTCGTGGGCGTGGGCG  
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CCCGAGTGCCAGACTCCACCAGACGAACAGATGTGGGTGCTGGTGCTTTGCGTCGTAGTGA  
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CGAATGTGATGTGTTGGGCAAAGACATTCTGTTATGTGACCCCATCCCGCTGGACACTGAAG  
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GTCTGGGGAAGTGTACTACAGCATTGAAAAAGAAAGGCCAAAGAAAGTGGTATAAGCGAATG  
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ATGAAGCAGTAACACCTCTTACAAAGGCAGCAGATATCAGCTTAGACAATTTGGTGGAAGGG  
AAGCGGAAACGGCGCAGTAACGTGAGCTCCCCAGCCACCCCTACTGCCTCCAGTAGCAGCA  
GCACAACCCCTACCCGAAAGATCACAGAAAGTCCTCGTGCCTCCATGGGAGTTCTCTCAGG  
CAAAAGAAAACCTTATCACTTCTGAAGAGGAACGGTCCCCTGCCAAGCGAGGTGCAAGTCT  
GCCACAGTAAAACCTGGTGCAGTAGGGGCAGGAGAGTTTGTGAGCCCTGTGAGAGTGGA  
GACAACACCGGTGAACCCCTCTGCCCTGGAAGAGCAGAGAGGGCCTTTGCCTCTCAACAAGA  
CCTTGTTTCTGGGCTACGCATTTCTCCTTACCATGGCCACAACCAGTGACAAGTTGGCCAGC  
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TTCTCCTTTCAACAAGCAGTATACAGAATCCCAGCTTCGAGCAGGAGCTGGCTATATCCTT  
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CTCATGACTGGTGGTGACGCTCTGTGAAGCAGCACCATTCAAGTGCCCATACAAAGATAT  
TGCTTTAGGGGTATTTGATGTGGTGGTGACGGACCCCTCATGCCAGCCTCGGTGCTGAAG  
TGTGCTGAAGCATTGCAGCTGCCTGTGGTGTCAAGAGTGGGTGATCCAGTGCCTCATTG  
TTGGGGAGAGAATTGGATTCAAGCAGCATCCAAAATATAAACACGATTATGTTTCTACTAA

Fig 29 (cont'd)

**Figure 30**  
**Rad9**

>gi|6320423|ref|NP\_010503.1| Required for-DNA damage-induced G2 arrest in mitosis, required for ionizing radation-induced G1 arrest, and other cdc13-induced G2 arrest in meiosis; Rad9p [Saccharomyces cerevisiae]

MSGQLVQWKSSPDRVTQSAIKEALHSPLADGDMNEMNVPVDPLENKVNSTNIIEGSPKANPNPV  
KFMNTSEIFQKSLGLLDESPRHDELNIEVGDNDRPNANILHNERTPDLDRANFFKSNRTPGKE  
NLLTKYQSSDLEDTPMLRKKMTFQTPTDPLEQKTFKKLKSDTGFCYYGEQNDGEENASLEVTE  
ADATFVQMAERSADNYDCALEGIVTPKRYKDELSKSGGMQDERVQKTQIMISAESPNSISSYDK  
NKITGNGRTRNVNKFNNEDNIGAIEEKNPVKKKSENYSSDDLRRNNQIIQSESEEINELEK  
NLNVSGRENDVNNLDIDINSASVSGTPSRNNAEEEMYSSSVNNREPSKKWIFRYSKDKTENNSN  
RSTQIVNNPRTQEMPLDSISIDTQPLSKSFNTETNNELETQIIVSSLSQGISAQKGPVFHSTGQTEE  
IKTQIINSPEQNALNATFETPVTLSRINFEPILEVPETSSPSKNTMSKPSNSSPIPKEKDTFNIHERE  
VETNNVFSNDIQNSSNAATRDDIIIAGSSDFNEQKEITDRIYLQLSGKQISDSGSDETERMSPNEL  
DTKKESTIMSEVELTQELPEVEEQDQLQTSPPKLVVEEETLMEIKKSKGNSLQLHDDNKECNSDK  
QDGTESLDVALIEHESKGQSSELQKNLMQLFPSESQEIIQNRRTIKRRQKDTIEIGEEEEENRSTKT  
SPTKHLKRNSDLDAASIKREPSCSITIQGETGSGKDSKEQSYVFPEGIRTADNSFLSKDDIIFGNA  
VWCQYTWNYKFYPGILLEVDTNQDGCWIYFETGRSLTKDEDIYYLDIRIGDAVTFDGNEYVVVGL  
ECRSHDLNIIRCIRGYDTVHLKKKNASGLLGKRTLIALSSISLDLSEWAKRAKILEDNEKNKGDA  
YRYLRHPIRGRKSMTNVLSPKKHTDDEKDINTHTEVYNNEIESSSEKKEIVKKDSRDALAEHAGA  
PSLLFSSGEIRTGNVFDKCIFVLTSLFENREELRQTIESQGGTVIESGFSTLFNFTHPLAKSLVNKG  
NTDNIRELALKLAWKPHSLFADCRFACLITKRHLRSLKYLETLALGWPTLHWKFISACIEKKRIVPH  
LIYQYLLPSGESFRLSLDSPSKGGIIKSNNIFSFTYQFLRGSNLRDQICGVKKMLNDYIVIVWGRSE  
LDSFVKFAFACLSAGRMLTIDLPNIDVDDTEPLLNALDSLVPRIGSELSNRKLKFLIYANENNGKSQ  
MKLLERLRSQISLKFKKFNIFHTESKEWLIQTIINEDTGFHDDITDNDIYNTISEVR

# Figure 31

>gil37362627:c903471-899542 *Saccharomyces cerevisiae* chromosome IV, complete  
 chromosome sequence

ATGTCAGGCCAGTTAGTTCAATGGAAAAGCTCTCCAGATCGAGTCACCCAAAGCGCTATAAA  
 GGAAGCACTGCATTCTCCCTTGGCTGATGGCGACATGAACGAAATGAATGTTCCCGTTGATC  
 CGTTGGAAAACAAGGTAAATAGCACAAACATAATCGAAGGAAGTCCCAAAGCAAATCCAAAT  
 CCTGTCAAGTTTATGAATACAAGTGAGATATTTCAAAAATCTCTGGGATTACTTGACGAGAGT  
 CCAAGACATGATGATGAGTTAAATATTGAAGTAGGAGATAATGATCGACCAAATGCTAACATA  
 TTGCATAATGAAAGGACTCCTGACCTTGACCGAATTGCTAACTTTTTCAAAAGCAATCGAACC  
 CCTGGTAAAGAAAATCTTTTGACCAAATATCAAAGCTCCGATCTGGAAGACACTCCTCTGATG  
 TTAAGAAAAAAAATGACTTTTTCAAACCTCAAATGATCCATTGGAACAGAAAACCTTCAAAAAG  
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 ATGAGTGTGGATTGGAAGGAATTTGTTAGAGGTAAAAGATATAAAGAGGAATFAAGTAAAAGTG  
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 CGATAAGCTCTTATGACAAGAACAAAATTACCGGGAATGGCCGGACCACAAGAAATGTAAAC  
 AAGGTTTTTAACAATAACGAAGATAACATAGGAGCTATCGAGGAAAAAAATCCAGTAAAAAAG  
 AAAAGTGAGAACTATTATCAGATGATCTCAGAGAACGGAACAATCAAATAATACAAAGTAAT  
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 GAACAATTTAGATATCGATATTAATAGTGCTGTGTCTGGCACCCCTTCACGCAACAATGCGG  
 AAGAAGAAATGTATTCCAGTGAGAGTGTAACAATCGGAACCATCCAAGAAGTGGATATTC  
 CGATACTCAAAGACAAAACGGAAAAATAATAGCAATAGATCTACGCAAAATAGTCAATAATCCA  
 AGAACACAGGAAATGCCTTTAGATAGTATTTCAATCGATACGCAACCCTTATCTAAAAGTTTC  
 AATACCGAAACAAATAATGAATTAGAGACACAGATAATTGTTTCATCGCTTTCCCAAGGCATA  
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 ATAAATTCTCCTGAACAAAATGCTTTGAATGCAACCTTTGAAACTCCCGTTACTCTTTCTCGG  
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 AAACCCTCGAATTCTTCACCTATTCCGAAGGAAAAAGATACATTTAATATACACGAGAGAGAA  
 GTAGAGACAAACAATGTTTTTCAAACGATATACAAAATTCTTCAAATGCAGCTACCAGAGAT  
 GACATTATCATAGCCGTTTCTGATTTCAACGAACAAAAGGAAATAACCGATAGAATATAC  
 TTACAACCTTTCAGGAAAGCAAATATCTGATTGAGGAAGTGATGAAACAGAACGTATGTCCCA  
 AATGAGCTTGATACGAAAAAGGAAAGTACAATCATGAGCGAGGTTGAACTAACCCAAGAACT  
 GCCTGAAGTTGAAGAGCAGCAAGATCTTCAAACGTCTCCAAAAAAGCTGGTAGTCGAGGAA  
 GAACTTTAATGGAGATAAAAAAAGCAAGGGGAACTCACTTCAGCTTCATGATGATAATAAA  
 GAATGCAATTGAGATAAACAAGATGGCACAGAGTCTTTGGATGTAGCTTTGATTGAACACGA  
 AAGCAAAGGACAGAGCTCAGAACTTCAGAAAAACCTCATGCAATTATTTCCAAGTGAGTCAC  
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 GAAGAGGAGGAGAACAGAAGCACTAAGACATCACCGACAAAACACCTCAAAAGAAATTCAG  
 ATTTGGATGCTGCTTCTATCAAAAGGGAACCGTCTTGACGATTACCATACAAACAGGGGAG  
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 AGATAATAGTTTCTTATCGAAAGACGACATAATTTTTGGAAATGCGGTATGGTGTCAGTATAC  
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 CGAAGAAACATACTGATGACGAAAAGGACATAAATACGCATACTGAAGTGTACAATAACGAA  
 ATAGAATCGAGCTCCGAAAAGAAGGAAATTGTTAAAAAGGATTCTAGAGACGCATTAGCTGA  
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 AATCGCAAGGCGGCACTGTAATTGAGTCAGGATTTTCCACTTTATTTAACTTCACTCATCCGC  
 TAGCTAAATCTTTAGTCAATAAAGGTAATACAGATAATATTGAGAATTGGCCTTGAAGCTAG  
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(Fig 31 contd)